electron user

Vol. 1 No. 4   January 1984

Most of the listings in this issue also work on the BBC Micro. See Page 3.

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with David Redclift

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NEXT month *Electron User* leaves the shelter of The Micro User's pages and starts life as a big magazine in its own right.

It's going to have all the features you've grown to expect – but lots, lots more. We promise you a magazine packed with pages of colourful, exciting listings. Plus frank reviews of all the books, software and hardware now being produced for the Electron.

This first independent issue will see the start of two major series aimed specifically at the beginner – one on Electron Basic, the other on its graphics abilities.

However, we won't be ignoring those of you who are a little more advanced.

Electron User will be covering all aspects of the micro from how it works to how to get it working. Our experts will be revealing for you the full potential of this amazing machine.

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To make sure you get the first issue – available in mid-January – place an order with your newsagent NOW.

Or better still, take out a subscription and you'll get your copy every month hot off the press. There's a subscription form on Page 31.

Runaway success for the Electron

ALL over the country demand for the Electron is exceeding supply.

Acorn are being very tight-lipped about the number they are actually producing but it is certainly not enough to satisfy everyone who wants one.

Dealers across the country are desperate for Electrons.

"I can sell every one I can get my hands on", said one.

"I've had one delivery and it nowhere near satisfied my waiting list!

"I haven't even got one for my nephew and my wife's none too pleased about that".

More evidence of the phenomenal interest comes from Leeds.

When the local W.H. Smiths announced that Electrons would be on sale at their new computer shop the result was amazing.

People started queueing the night before – even camping outside the shop. As it was, not everyone was successful.

W.H. Smiths was as forthcoming as Acorn about the numbers of Electrons being produced. However their spokesperson could be drawn about the demand for the micro.

"The Electron is almost embarrassingly successful. It's awful not being able to satisfy everyone who wants one", he said.

Hopefully the situation should improve in the new year when Electrons will be available from three countries – Malaysia, Indonesia and Wales.

ALL the programs in this month's *Electron User* should work on a BBC Micro 1.2 OS with Basic II.

Combinations (Pages 6-7) will work with Basic I if you change the semi-colons in the INPUT statements to commas (or even leave them out). However, Microcosmic (Pages 8-9) won't work with Basic I.

Sideways ROM board on show

THE sideways ROM board from SIR computers was recently demonstrated at the offices of *The Micro User.*

The prototype board had room for eight sideways ROMs.

Paul Kathro, the firm's technical director, said: "Eight ROMs were chosen in order to leave room for sockets involved in our later expansions, such as a printer and RS423 ROMs".

Paul disclosed that in his investigations of the ROM system on the Electron he'd discovered that the Basic is actually split between two ROMs.

And the keyboard itself is treated as a sideways ROM.

Unfortunately, the lack of Mode 7 on the Electron restricts the number of BBC Micro ROMs transferable to it.

At present View, Edword and HCCS Forth run successfully on the Electron.

No doubt, with the launch of SIR's board, many companies will be encouraged to adapt or create ROM-based software.

THE kaleidoscope was invented more than 150 years ago. There are several types which differ slightly in detail.

However, the essential feature of all is a basic random pattern, possibly produced by pieces of brightly coloured glass, which is reflected in mirrors to form symmetrical patterns of considerable aesethic appeal.

Of course, once tired of one pattern, a little shake and there is another!

A common type of kaleido-

```
10REM KALEIDOSCOPE
20REM (C) ELECTRON USER
30MODE1
40PROCinit
50PROCpage1
60PROCpage2
70MODE 2:VDU5:CLS
80CZ=RND(7):VDU 19,0,CZ,0,0,0
90FOR LZ=1 TO 6
100PROCcalcs
110GCOL 0,RND(7)
120IF S$="A" THEN KZ=1:GOTO 140
130FOR KZ=1 TO 7
140VDU29,XCZ(KZ);YCZ(KZ);
150PROCtriangles
160IF S$="A" THEN GOTO 180
170NEXT KZ
180NEXT LZ
190PROCterm
200IF GZ THEN GOTO 70
210MODE7
220END
230
240DEF PROCtitle
250VDU19,1,5;0;19,3,2;0;31,8,5:COLOUR1
260PRINT"**** KALEIDOSCOPE **** "
270VDU 31,8,6:COLOUR3
280PRINT"**** KALEIDOSCOPE **** "
290VDU 31,11,9:COLOUR1
300PRINT"**** PATTERNS **** "
310VDU 31,11,10:COLOUR3
320PRINT"**** PATTERNS **** "
330ENDPROC
340DEF PROCpage1
350PROCtitle:COLOUR2
360PRINT TAB(3,15);"This program operates in TWO modes "
370VDU 31,5,19:COLOUR3
380PRINT"MODE A....A single large pattern"
390VDU 31,5,22:COLOUR1
400PRINT"MODE B....Multiple patterns"
410VDU 31,3,26:COLOUR2
420PRINT"SELECT the pattern MODE you require"
430VDU 31,9,29
440PRINT"by PRESSING key A OR B"
450*FX21,0
460S$=GET$
470IF S$="A" OR S$="B" GOTO 480 ELSE GOTO 450
480FOR IZ=1 TO 500:NEXT IZ:VDU7
490ENDPROC
500DEF PROCpage2
510CLS
520PROCtitle:COLOUR2
530VDU 31,4,14:PRINT"WHEN EACH PATTERN IS COMPLETE"
540VDU 31,10,16:PRINT"SELECT ONE OF THE FOLLOWING"
550VDU 31,4,18:COLOUR3:PRINT"Press the 'SPACE BAR'"
560VDU 31,10,19:PRINT"to produce another pattern"
570VDU 31,4,21:PRINT"Press key 'C'"
580VDU 31,10,22:PRINT"to CHANGE pattern mode"
590VDU 31,4,24:PRINT"Press key 'T'"
600VDU 31,10,25:PRINT"to TERMINATE program"
610VDU 31,4,28:COLOUR2:PRINT"PRESS THE";:COLOUR1:PRINT" SPACE BAR";:COLOUR2:PRINT" TO"
620VDU 31,8,30:PRINT"PRODUCE THE FIRST PATTERN "
630F$=GET$:IF F$<>" "THEN GOTO 630
640ENDPROC
650
660DEF PROCinit
670DIM X(3,3),Y(3,3),XCZ(7),YCZ(7)
680FOR IZ=1 TO 7:READ XCZ(IZ),YCZ(IZ):NEXT
690DATA 640,514,370,994,910,994,1180,514,910,34,370,34,100,514
700SCALE1=250:SCALE2=400
710ENDPROC
720
730DEF PROCcalcs
740IFS$="A" THEN SCALE=SCALE2 ELSE SCALE=SCALE1
750FOR JZ=1 TO 3
760R=SCALE*RND(1):TH=1.047*(RND(1)+0.5)
770X(1,JZ)=R*COS(TH):Y(1,JZ)=R*SIN(TH)
780XH=X(1,JZ)/2:XV=X(1,JZ)*0.866
790YH=Y(1,JZ)*0.866:YV=Y(1,JZ)/2
800X(2,JZ)=YH+XH:Y(2,JZ)=-YV+XV
810X(3,JZ)=YH-XH:Y(3,JZ)=-YV-XV
820NEXT
830ENDPROC
840
850DEF PROCtriangles
860FOR IZ=1 TO 3
870MOVE X(IZ,1),Y(IZ,1)
880MOVE X(IZ,2),Y(IZ,2)
890PLOT 85,X(IZ,3),Y(IZ,3)
900MOVE -X(IZ,1),Y(IZ,1)
910MOVE -X(IZ,2),Y(IZ,2)
920PLOT 85,-X(IZ,3),Y(IZ,3)
930NEXT
940ENDPROC
950
960DEF PROCterm
970*FX15,1
980GZ=0:B$=GET$
990IF B$="T" THEN ENDPROC
1000IF B$=" " THEN GZ=1:ENDPROC
1010IF B$="C" THEN GOTO 1020 ELSE GOTO 970
1020IF S$="A" THEN S$="B" ELSE S$="A"
1030GZ=-1
1040ENDPROC
```

Create a colourful kaleidoscope

A fascinating and inspiring program by GWEN and ROY COLLIER

scope consisted of three similar mirrors joined at their edges so that the cross-section was an equilaterial triangle.

This program given here simulates the patterns produced by this kind of instrument.

The basic patterns produced within the triangle, together with five reflections, is a hexagonally symmetrical pattern which can be viewed by selecting MODE A from the menu.

MODE B, on the other hand, shows more reflections, giving a field of view which is similar to part of a wallpaper or fabric design.

Naturally, the construction of the basic pattern relies much on the RND number function.

Line 80 replaces the black background with a randomly selected colour, while line 110 selects a colour for each of the basic pattern components, which, for simplicity, are triangles.

The vertices of each triangle are randomly generated in line 760. This produces the polar co-ordinates of a point in the triangle shown in the diagram.

These are then transformed into cartesians in the next line.

The remainder of the PROCcalcs calculates the co-ordinates of two corresponding reflected points to the right of the Y-axis.

The reflected points to the left of the Y-axis are easily obtained by simply changing the sign of each X co-ordinate.

This is done in PROC-triangles when the triangles are actually drawn.

For those who like to experiment with their own modifications to programs here are a few suggestions.

After some experimentation we have deliberately eliminated black from the colour palette. If you would like to include it, you will need another suitable VDU 19 command on line 80.

Each basic pattern consists of six coloured triangles. If you would like to experiment with more or less you should change '6', the loop terminating parameter, in line 90.

It is rather annoying when the last triangle in a pattern is a large one which blots out a very promising pattern.

There are various strategies which can be employed to avoid this. For instance, SCALE (line 760) can be reduced as the variable L% increases.

The kaleidoscope was originally exclusively produced as a toy. However, it has also had more serious applications as a source of inspiration to designers.

We are sure that after viewing a few of the patterns created on your Electron the reason for this will become evident.

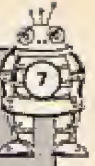*P is somewhere in this triangle*

+ P(x,y)

TH

X
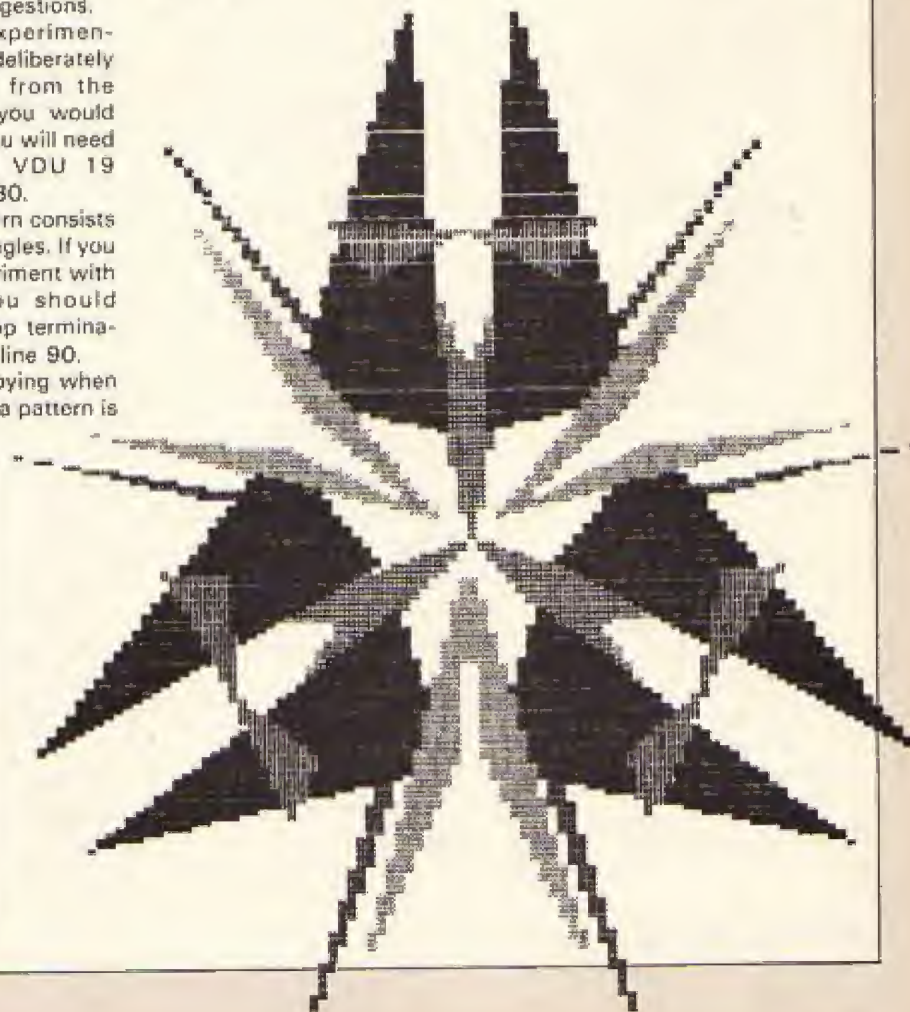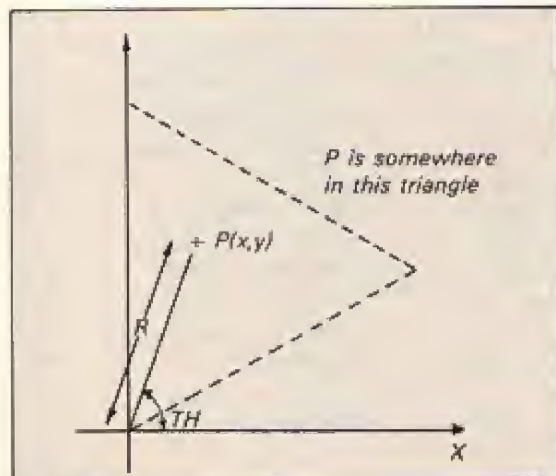
PUZZLE THIS ONE

```
10 REM COMBINATIONS
20 REM (C) ELECTRON USER
30 REM by Pete Bibby
40 MODE 1
50 VDU 19,1,4;0;
   :COLOUR 1
   :COLOUR 130
60 VDU 23,1;0;0;0;0;
70 CLS
   :PROCinstruct
80 REPEAT
90 PROCinit
100 PROCscreen
110 PROCguess
120 UNTIL FALSE
130 END
140 DEF PROCinit
150 count=0
160 CLS
170 a$=STR$ (RND(10) -1)
180 b$=STR$ (RND(10) -1)
190 c$=STR$ (RND(10) -1)
200 target number$=a$+b$+c$
210 blank$=STRING$(40
    ," ")
220 ENDPROC
230 DEF PROCscreen
240 PRINT TAB(18,8) "h"
    :PRINT TAB(18,10) "?"
250 PRINT TAB(20,8) "t"
    :PRINT TAB(20,10) "?"
260 PRINT TAB(22,8) "u"
    :PRINT TAB(22,10) "?"
270 ENDPROC
280 DEF PROCguess
290 PRINT TAB(3,17) " Enter
    a number and press
    Return"
300 INPUT TAB(3,3) "How
    many hundreds are
    there";x$
310 IF VAL (x$)<0 OR
    VAL (x$)>9
    THEN GOTO 300
320 PRINT TAB(18,10) x$
330 PRINT TAB(0,3);blank$
    :PRINT TAB(3,17);blank$
340 PRINT TAB(3,17)" Enter
    a number and press
    Return"
350 INPUT TAB(3,3) "How
    many tens are there";y$
360 IF VAL (y$)<0 OR
```

```
VAL (y$)>9
    THEN GOTO 350
370 PRINT TAB(20,10) y$
380 PRINT TAB(0,3);blank$
    :PRINT TAB(3,17);blank$
390 PRINT TAB(3,17)" Enter
    a number and press
    Return"
400 INPUT TAB(3,3) "How
    many units are there";
    z$
410 IF VAL (z$)<0 OR
    VAL (z$)>9
    THEN GOTO 400
420 PRINT TAB(22,10) z$
430 PRINT TAB(0,3);blank$
    :PRINT TAB(0,12);blank$
    :PRINT TAB(3,17);blank$
440 PRINT TAB(3,3) "Do
    you want to check
    this number?"
450 INPUT TAB(3,5) "Enter
    Y or N and press Retur
    n"trial$
460 PRINT TAB(0,3);blank$
    :PRINT TAB(0,5);blank$
470 IF trial$="Y" OR trial$
    ="y"
    THEN PROCcheck
    ELSE PRINT TAB(0,10);bl
    ank$
    :PRINT TAB(18,10)"?"
    TAB(20,10)"?"
    TAB(22,10)"?"
    :PROCguess
480 ENDPROC
490 DEF PROCcheck
500 count=count+1
510 IF a$=x$ AND b$=y$
    AND c$=z$
    THEN PROCwin
    ELSE PROChint
520 ENDPROC
530 DEF PROChint
540 IF a$<x$
    THEN PRINT TAB(18
    ,12)">"
550 IF b$<y$
    THEN PRINT TAB(20
    ,12)">"
560 IF c$<z$
    THEN PRINT TAB(22
    ,12)">"
```

```
570 IF a$>x$
    THEN PRINT TAB(18
    ,12)"<"
580 IF b$>y$
    THEN PRINT TAB(20
    ,12)"<"
590 IF c$>z$
    THEN PRINT TAB(22
    ,12)"<"
600 IF a$=x$
    THEN PRINT TAB(18
    ,12)"="
610 IF b$=y$
    THEN PRINT TAB(20
    ,12)"="
620 IF c$=z$
    THEN PRINT TAB(22
    ,12)"="
630 PROCguess
640 ENDPROC
650 DEF PROCwin
660 CLS
670 PRINT TAB(15,10)"CONGRA
    TULATIONS"
680 PRINT TAB(15,12)" The
    answer is "
690 PRINT TAB(21,14) target
    number$
700 IF count=1 PRINT
    TAB(20,20)"Luck!"
    ELSE PRINT TAB(15
    ,20)"You took ";count;
    " goes."
710 FOR X=1 TO 2000
    :NEXT X
    :CLS
720 ENDPROC
730 DEF PROCinstruct
740 PRINT TAB(13,3) "COMBIN
    ATIONS"TAB(13,4)"++++++
    ++++++"
750 PRINT TAB(2,8) "The
    Electron will 'think'
    of a three"TAB(2
    ,10) "figure number.
    It will then display"
760 PRINT TAB(18,12) "?
    ? ?"TAB(2,14)"on the
    screen and wait for
    your guess."
770 PRINT TAB(2,16)"After
    each guess the micro
    will tell "TAB(2,18)
```

```
    "you whether the figur
    es you entered"
780 PRINT TAB(2,20)"are
    too high or too low.
    If it's"TAB(2,22)
    "too low then < the
    'less than' sign"
790 PRINT TAB(2,24)"appears
    below that numeral,
    showing"TAB(2,26)
    "that the figure you
    picked is less"
800 PRINT TAB(2,24)"appears
    below that numeral,
    showing"TAB(2,26)
    "that the figure you
    picked is less"
810 PRINT TAB(2,28)"than
    it should be."
820 FOR delay=1 TO 8000
    :NEXT delay
    :CLS
830 PRINT TAB(13,3) "COMBIN
    ATIONS"TAB(13,4)"++++++
    ++++++"
840 PRINT TAB(2,8) "Similar
    ly if the figure is
    too high"TAB(2,10)
    "> the 'greater than'
    sign will appear"
850 PRINT TAB(2,12) "below
    it."
860 PRINT TAB(2,14) "If
    the figure is the
    right one then"
    TAB(2,16)"an equals
    sign = will be display
    ed."
870 PRINT TAB(2,18)"You
    can then have another
    go."TAB(2,20)"The
    Electron is keeping
    count and it"
880 PRINT TAB(2,22)"will
    tell you how many
    goes you take"
890 PRINT TAB(2,24)"to
    guess all three digits
    correctly."
900 FOR delay=1 TO 8000
    :NEXT delay
    :CLS
910 ENDPROC
```
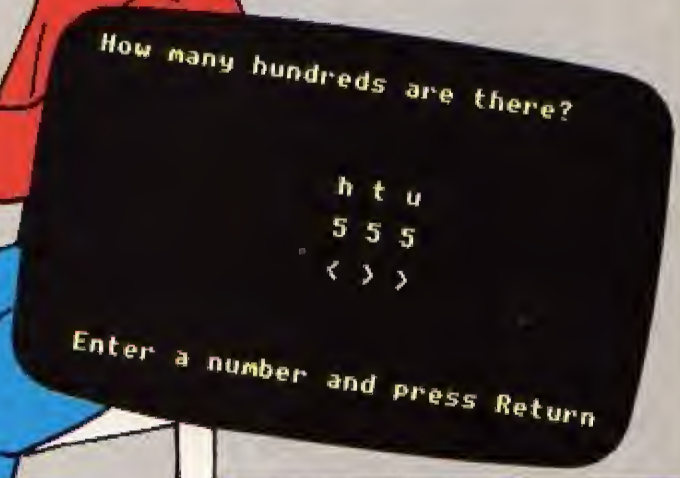
WELL, not only do you have an Electron, but with Orbit we give you several more.

No, not free micros but an animated model of how the sub-atomic particles called electrons spin round the centre of the atom.

You get models of the Hydrogen, Helium, Beryllium, Carbon and Oxygen atoms displayed on your screen for you to wonder at and to amaze your friends.

While you're gazing at the screen you might notice that as the number of orbiting electrons goes up the speed goes down.

This illustrates one of the sad facts of using a micro — the more you want on the screen the slower things tend to go.

In order to speed things up integer variables such as P% and J%, are used as much as possible as these help the micro work more quickly.

"But", the more knowledgeable might ask", if you're so concerned with speed why the delay loop in line 360?"

A good question. The answer is that it's there to smooth out the motion of the electrons. Leave it out and the animation will move at full speed.

MICROCOSMIC
MODELS

```
  1 REM Electron orbit
 10 PROCinitial
 20 MODE 5
    :VDU 28,6,30,15,29
 30 VDU 29,640;512;
 40 GCOL 0,3
    :PRINT 'HYDROGEN'
    :VDU 5
    :PROCnucleon(-32,32)
 50 PROCorbit(1)
 60 PROCHnucleus(-32,32)
    :VDU 4
    :PRINT " HELIUM"
    :VDU 5
 70 PROCorbit(2)
 80 PROCHnucleus(-96,64)
    :VDU 4
    :PRINT "BERYLLIUM"
    :VDU 5
 90 PROCorbit(4)
100 PROCHnucleus(32,64)
    :VDU 4
    :PRINT " CARBON"
    :VDU 5
110 PROCorbit(6)
120 PROCHnucleus(-32,96)
    :VDU 4
    :PRINT " OXYGEN"
    :VDU 5
130 PROCorbit(8)
140 END
150 DEF PROCnucleon(X%,Y%)
160 MOVE X%,Y%
    :VDU 240
    :MOVE X%,Y%-32
    :VDU 241
170 ENDPROC
180 DEF PROCHnucleus(X%
    ,Y%)
190 GCOL 0,3
    :PROCnucleon(X%,Y%)
200 GCOL 0,1
    :X%=X%-32
    :Y%=Y%-32
    :PROCnucleon(X%,Y%)
210 X%=X%+64
    :PROCnucleon(X%,Y%)
220 GCOL 0,3
    :X%=X%-32
    :Y%=Y%-32
    :PROCnucleon(X%,Y%)
230 ENDPROC
240 DEF PROCorbit(N%)
250 GCOL 3,2
260 FOR J%=0TO N%-1
270 MOVE P%(J%,0,1),P%(J%
    ,0,2)
    :VDU 242
280 NEXT
```

```
290 REPEAT
300 FOR I%=1TO 40
310 TIME =0
320 FOR J%=0TO N%-1
330 MOVE P%(J%,I%,1),P%(J%
    ,I%,2)
    :VDU 242
340 MOVE P%(J%,I%-1,1),P%(J%
    ,I%-1,2)
    :VDU 243
350 NEXT
360 REPEAT UNTIL TIME >16
370 NEXT
380 UNTIL INKEY (0)=32
390 FOR J%=0TO N%-1
400 MOVE P%(J%,40,1),P%(J%
    ,40,2)
    :VDU 242
410 NEXT
420 ENDPROC
430 DEF PROCinitial
440 CLS
    :PRINT TAB(0,14)"It takes
     about 30 seconds to
     initialise the array."
450 DIM P%(7,40,2)
460 FOR I%=0TO 40
470 X=500*COS (I%*PI /20)
    :Y=250*SIN (I%*PI /20)
480 A=ATN (Y/X)
    :IF X<0
    THEN A=A-PI
490 R=SQR (X*X+Y*Y)
500 FOR J%=0TO 7
510 P%(J%,I%,1)=R*COS (A+J%*4
    )
    :P%(J%,I%,2)=R*SIN (A+J%*
    4)
520 IF J%<2
    THEN P%(J%,I%,2)=P%(J%
    ,I%,2)/2
    :P%(J%,I%,1)=P%(J%,I%
    ,1)/2
530 NEXT
    :NEXT
    :*FX15,1
540 PRINT "It is ready, press
     space to continue."
    :REPEAT UNTIL INKEY (0)=32
550 VDU 23,240,60,60,126
    ,126,255,255,255,255
560 VDU 23,241,255,255,255
    ,255,126,126,60,60
570 VDU 23,242,24,24,60
    ,60,60,60,24,24
580 VDU 23,243,24,24,60
    ,60,52,60,24,24
590 ENDPROC
```

After Sunday dinner settle down and challenge SIMON
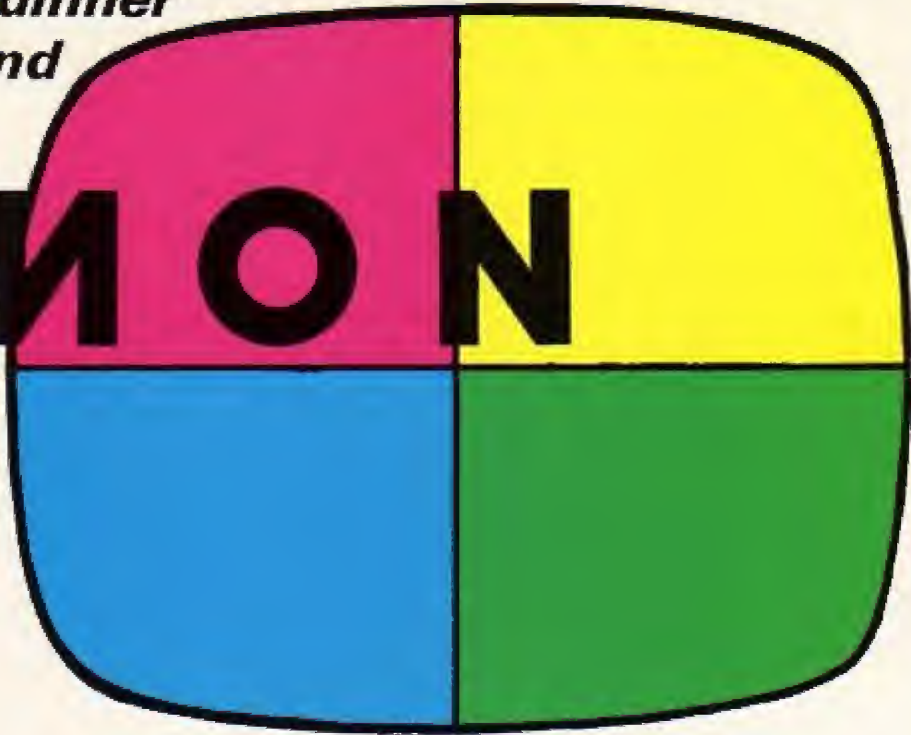
HAVE you ever played the children's game Simon Said, or its electronic reincarnation, Simon? Well here's a version of the game for your Electron.

The idea of the game is that the screen is divided into quarters.

Each of these is used to display a different colour and each colour has a different note associated with it.

The quarters then light up in a random order, though only one appears on the screen at a time.

After lighting up the various parts of the screen – with appropriate noises – the Electron then dares you to copy it.

You have to use the keyboard keys to reproduce the sequence in the right order.

At first it's easy because

there's only a few in the series, but it does get more complicated.

When it's not driving you mad it's great fun! If you make a mistake you go back to the beginning again.

While the game gets progressively harder, you'll find that using the keyboard to type in your replies is easy.

Key A corresponds to the top left of the screen, key S to the top right, key Z the bottom left and key X the bottom right.

Suppose the Electron lights up the top left of the screen, then the bottom right. To copy it you press A then X. Suppose that it then adds the top left of the screen (again)

to the sequence. To copy it you must press A, X, then A again.

S will start the whole thing off, R will replay the sequence for you and E will end it.

Anyway it's much easier to play than to write about so why waste your time reading this when you could be getting on with the game?

```
 10 REM SIMON
 20 REM (C)ELECTRON USER
 30 *FX4,1
 40 DIM G%(4),N%(200)
 50 LTH%=0
    :MODE 2
 60 FOR L%=1TO 4
    :READ G%(L%)
    :VDU 19,G%(L%),0,0,0
    ,0
    :NEXT
 70 FOR L%=1TO 4
    :READ A,B,C,D
    :VDU 28,A,B,C,D
    :COLOUR G%(L%)
    :CLS
    :NEXT
 80 VDU 5
    :GCOL 0,134
    :MOVE 400,500
    :PRINT "R=replay"
    :MOVE 400,600
```

```
    :PRINT "S=start"
    :MOVE 400,700
    :PRINT "E=end"
 90 VDU 19,6,6,0,0,0
    :IF INKEY (-35)
    THEN 110
    ELSE IF INKEY (-82)
    THEN 140
    ELSE IF INKEY (-52)
    AND LTH%()0
    THEN 100
    ELSE 90
100 VDU 19,6,0,0,0,0
    :DELAY%=1000
    :FOR B%=1TO LTH%
    :X%=N%(B%)
    :PROCSQUARE
    :NEXT
    :GOTO 90
110 DELAY%=100
    :FOR X%=1TO 4
    :PROCSQUARE
```

```
    :NEXT
    :FOR L%=1TO 400
    :NEXT
    :MODE 6
    :PRINT ''
    :*FX15
120 *FX4
130 END
140 VDU 19,6,0,0,0,0
    :LTH%=0
150 FOR L%=1TO 1500
    :NEXT
    :DELAY%=800
    :X%=RND(4)
    :LTH%=LTH%+1
    :N%(LTH%)=X%
    :FOR B%=1TO LTH%
    :X%=N%(B%)
    :PROCSQUARE
    :NEXT
    :FOR B%=1TO LTH%
    :*FX15
```

```
160 TIME =0
170 A$=INKEY$ (1)
    :IF A$=""AND TIME <200
    THEN 170
    ELSE IF TIME >200
    THEN B%=300
    :GOTO 240
180 ON N%(B%)GOTO 190 ,200
    ,210 ,220
190 IF A$="A"
    THEN X%=1
    :GOTO 230
    ELSE B%=300
    :GOTO 240
200 IF A$="S"
    THEN X%=2
    :GOTO 230
    ELSE B%=300
    :GOTO 240
```
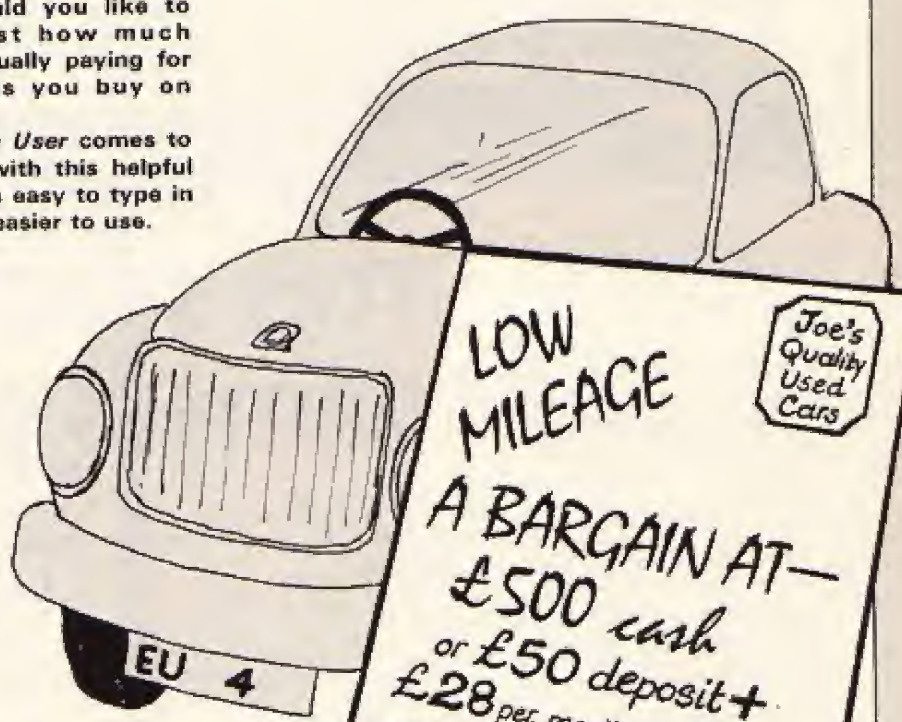
10
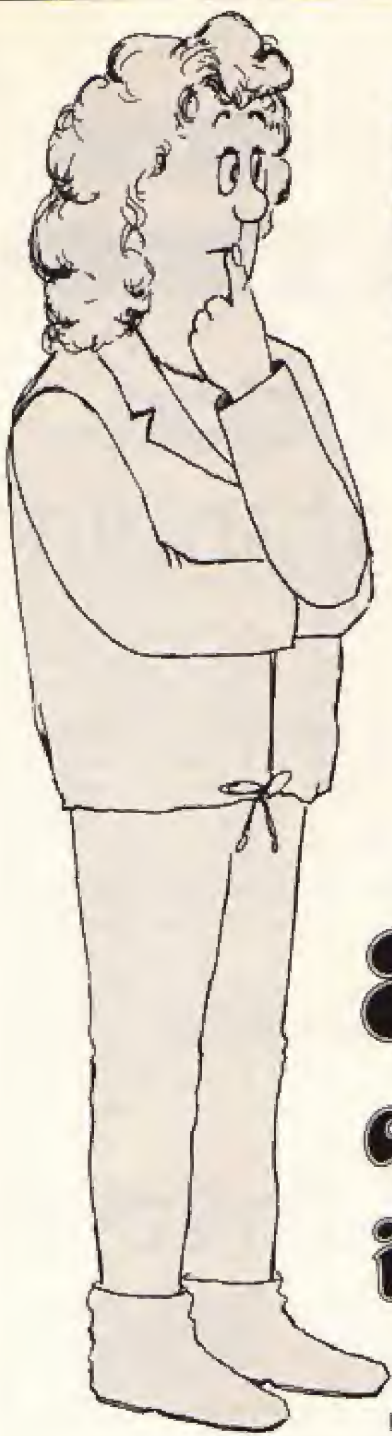
DO interest rates puzzle you? Would you like to know just how much you're actually paying for the things you buy on credit?

Electron User comes to your aid with this helpful listing. It's easy to type in and even easier to use.

LOW MILEAGE

A BARGAIN AT—
£500 *cash*
or £50 *deposit* +
£28 *per month over 2 years*

Joe's Quality Used Cars

Can you afford to miss this offer??

Taking an interest

By MARGARET JAMES

```
YOUR ACCOUNT IS AS FOLLOWS

TO BE PAID IN 5 YEAR/S

INTEREST RATE          18.00%

TOTAL INTEREST         £50.00

MONTHLY PAYMENTS OF     £2.50

TOTAL COST            £150.00


ANY MORE(Y/N)?
```

```
10 REM **MARGARET JAMES**
20 REM ** H/P INTEREST **
25 REM ** (C) ELECTRON
    USER **
30 MODE 6
40 COLOUR 0
50 COLOUR 131
60 VDU 23;8202;0;0;0
70 PRINT
80 CLS
90 PRINT ""THIS IS A PROGRAM
    TO WORK OUT INTEREST"
100 PRINT "AND COST OF ANY
    LOANS YOU WISH TO HAVE"
110 PRINT
120 INPUT "COST OF ITEM "A

130 INPUT "INTEREST RATE
    %"B
140 INPUT "HOW MANY YEARS
    WILL YOU NEED TO PAY?
    "D
150 C=A*(B/100)
160 G=(C*D)+A
170 E=G/D
180 PRINT "HOW DO YOU WISH
    TO PAY?"
190 PRINT "ENTER 1 FOR MONTHL
    Y"
200 PRINT "ENTER 2 FOR WEEKLY
    "
210 INPUT M$
220 CLS
230 PRINT ""* YOUR ACCOUNT

IS AS FOLLOWS "
240 PRINT "" TO BE PAID
    IN ";D;" YEAR/S"
250 @%=131594
260 PRINT "" INTEREST RATE
    "TAB(29);B"%"
270 PRINT "" TOTAL INTEREST
    "TAB(28)"£";C*D
280 IF M$ = "1"
    THEN 320
    ELSE 290
290 IF M$ = "2"
    THEN 340
300 IF M$ = < "1"OR M$ =
    > "2"
    THEN GOTO 310
310 CLS

:GOTO 190
320 PRINT "" MONTHLY PAYMENTS
    OF "TAB(28)"£";E/12
330 GOTO 350
340 PRINT "" WEEKLY PAYMENTS
    OF "TAB(28)"£";E/52
350 PRINT ' " TOTAL COST
    "TAB(28)"£";G
360 PRINT
    :PRINT
    :PRINT
370 @%=10
380 INPUT "ANY MORE(Y/N)"
    ,R$
390 IF R$="Y"
    THEN RUN
400 END
```

Software

CYLON ATTACK
A&F Software

PICTURE it. You're the only interceptor pilot on board an Earth supply ship. The alarm goes. The Cylons are attacking, wave after relentless wave determined to stop you getting through.

You launch into space away from the safety of the mother ship to try and destroy as many of the enemy as you can before your shields give way or your fuel runs out.

Your eyes search the long range scanners for a glimpse of the enemy before they

This space action game is outstanding

stoop to attack, curving and weaving to avoid your defence systems.

That's the scenario for Cylon Attack, the compulsive new game from A & F Software. You play the part of the interceptor pilot, struggling to get the Cylon ships in your sights so your lasers can lock on to them.

The screen of your micro becomes the view from the cockpit. Ranged around it are the instruments. They show the state of the lasers, your fuel, your rates of turn and spin, and a long range radar scanner.

This scanner is not just decoration, but really helps you to track down and destroy

the enemy. The 3-D effect has to be seen to be believed: the aliens loom out of deep space, growing larger as they approach to attack distance.

The game is quite simply excellent, with lots more features than can be described here. The graphics leave most other games standing. And, as usual from A & F, the instructions are simple but thorough.

The only problem is that I can't find anything about it to criticise. It really is that good, and sets the standard by which action games will be judged. Thoroughly recommended.

Trevor Roberts

Fun and fund-raising – fates for fêtes

HOROSCOPES
Third Program

IF you're like me you'll realise that all horoscopes are a load of rubbish and that no one in their right mind would believe them.

This doesn't, however, stop me reading them avidly, especially when they say nice things about my star sign and promise a rosy future.

From this you'll understand that I was hooked as soon as

Horoscope came into the office.

I loaded it up all eager expectation, but sadly I was a little disappointed as I found it rather limited.

Despite the title you don't actually get a forecast of the future, just a description of your personality traits.

When you run the program it askes you for your name, date of birth and sex, and then prints out the personality profile of your star sign. All interesting stuff and good fun.

The trouble is that the profile for each star sign is the same whichever sex you are and whatever day you were born on.

This means is that there are only really 12 profiles, one for each sign. This makes it fairly limited for home use.

Having said that, the program looks ideal for fund-raising at fetes, jumble sales and school open days. I can see it making a fortune for good causes.

Peter Gray

Tackle

FELIX IN THE FACTORY
Program Power

YOU know what it's like — you go into work for your shift and no one else has turned up so it's all left to you. Again . . .

Well that's what's facing you as you play the part of

```
210 IF A$="I"
    THEN XX=3
    :GOTO 230
    ELSE BX=300
    :GOTO 240
220 IF A$="X"
    THEN XX=4
    :GOTO 230
    ELSE BX=300
    :GOTO 240
```

```
230 DELAYX=250
    :PROCSQUARE
240 NEXT
    :IF BX=301
    THEN FOR LX=50TO 100
    STEP 2
    :SOUND 1,-15,LX,1
    :SOUND 1,-15,100-LX
    ,1
    :NEXT
```

```
    :GOTO 90
    ELSE 150
250 DEF PROCSQUARE
    :VDU 19,GX(XX),GX(XX)
    ,0,0,0
    :SOUND 1,-15,100+(XX*5)
    ,1
260 SOUND 1,-15,100+(XX+10)
    ,1
    :FOR LX=1TO DELAYX
```

```
    :NEXT
270 VDU 19,GX(XX),0,0,0
    ,0
    :FOR LX=1TO 70
    :NEXT
    :ENDPROC
280 DATA 131,132,129,130
    ,0,14,9,0,10,14,19,0
    ,0,30,9,15,10,30,19
    ,15
```

Surgery

OIL
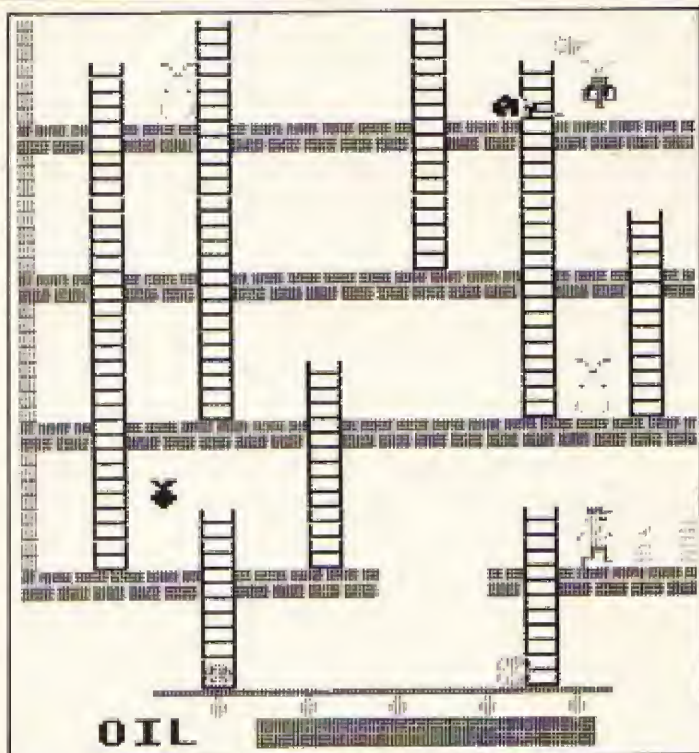
*Felix in action in the factory —
oiling the wheels of industry*

gremlins and giant mice

Felix, the hero of this game.
Your main job is to keep the generator oiled.

Easy enough, but the previous shift has left the oil cans all over the factory and you have to collect them before you can oil it and keep everything running smoothly.

This is where the work comes in.

The factory is a split level affair, the different levels being joined by ladders. Before you are able to collect the oil cans you have to negotiate a package-carrying conveyor belt.

It doesn't help that the place is infested with Gremlins and giant mice which attack you without warning or provocation.

Of course you can use the pitchfork and the bags of poison that are lying around

the place to ward them off but all this takes time and the generator is running out of oil every second.

And when you've succeeded your only reward is a still harder game!

It's not easy but it is fun, a fast game calling for quick reflexes and a sense of humour as you keep production flowing.

The instructions are clear and adequate, the controls simple and easy to use. The program's sound and graphics use the Electron's capabilities to the full.

All-in-all it's a good version of an old idea, and children love it. If you want an amusing action game for your Electron then Felix in the Factory is one to be considered.

Eileen Young

BOOKSHELF

The Electron Programmer
S.M. Gee and Mike James

THE launch of a new micro always results in a rush of books about it. The choice can become quite bewildering.

This is especially so in the case of the Acorn Electron as it's so ideally suited for a first micro.

This means that a lot of the people looking for books about it will have no previous experience to help them pick a book to meet their needs.

Because of this the appearance of The Electron Programmer is doubly welcome.

Firstly, it's a good read about an excellent micro and secondly it's a book which I can wholeheartedly recommend for the beginner.

It starts with the usual "What is a micro and how do you set it up?" It then goes on to the inevitable PRINT and LET.

All this is pretty traditional but then the authors break the mould.

They move straight on to a discussion of looping and choice, showing how the flow of control can be affected by the Basic structures used in a program.

The chapter on procedures and functions follows on from this, then comes a brief but useful section on handling strings and numbers on the micro.

The graphics abilities of the Electron aren't ignored, nor are its sound facilities. Each aspect is well covered and illustrated with a simple game.

The book finishes with a short but well explained treatment of logic and a chapter on better programming.

The style of the book falls between that of the two you found in the box with your new Electron.

It's both more readable than the User Guide (though obviously not as comprehensive) and more adult than the

Yazdani tome.

This will make it appeal to those who find the guide a little too technical but don't want to be talked down to.

All the way through the text the principles of good programming are illustrated with short but illuminating programs.

These are easy to type in and also encourage experiment.

I must warn, however, that there are a couple of typing errors which, although easy to spot, can be a bit confusing for a while.

The authors' aim is to teach complete newcomers how to write well structured, easy to understand Basic

THE ELECTRON PROGRAMMER

S.M. GEE AND MIKE JAMES

programs in a logical and coherent manner.

Happily, they don't attempt to produce a re-phrased, watered-down user guide but instead concern themselves with teaching the principles of good programming on the Electron.

Basic keywords and structures are introduced as necessary to illustrate these points, each being explained simply and lucidly.

This is where the book succeeds. Reading it a beginner will not only achieve a reasonably thorough command of Electron Basic but also have gained insight into the whys and wherefores of good programming.

Well worth considering.

Nigel Peters

DIGITAL DICE

HAVE you ever played a game that uses dice and had your doubts about the honesty of your opponents?

Well with Digital Dice your Electron will roll them for you, fairly and randomly.
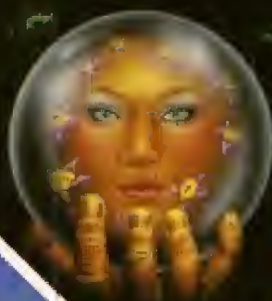
And blowing on the micro doesn't help!

```
 10 REM DICE
 20 REM (C)ELECTRON USER
 30 MODE 1
 40 COLOUR 129
    :COLOUR 2
 50 PRINT TAB(5,4)"PSEUDO
    RANDOM DICE GENERATOR"
 60 PRINT TAB(8,6)"FOR THE
    ACORN ELECTRON"
 70 PRINT TAB(8,8)"(c) ELECTR
    ON USER 1983"
 80 PRINT TAB(10,24);"PRESS
    ANY KEY TO START";
 90 G=GET
100 dummy=RND(-TIME )
110 REPEAT
120 PROCdice
130 PRINT TAB(0,24)"Throw
    again (Y/N)";
140 UNTIL GET$ ="N"
150 END
160 DEF PROCdice
170 COLOUR 128
180 CLS
190 COLOUR 129
200 PROCthrow
210 RESTORE
220 FOR N%=1 TO dice1
230 READ up$,mid$,low$
240 NEXT N%
250 PRINT TAB(4,10);up$;
    TAB(4,11);"      ";
    TAB(4,12);mid$;TAB(4
    ,13);"      ";TAB(4,14);lo
    w$
260 RESTORE
270 FOR N%=1 TO dice2
280 READ up$,mid$,low$
290 NEXT N%
300 PRINT TAB(20,10);up$;
    TAB(20,11);"      ";
    TAB(20,12);mid$;TAB(20
    ,13);"      ";TAB(20
    ,14);low$
310 COLOUR 128
320 PRINT TAB(6,18);dice1;
    TAB(22,18);dice2
330 IF dice1=dice2
    THEN PRINT TAB(9,16);
    "Doubles Up!";
340 ENDPROC
350 DEF PROCthrow
360 FOR throw=1 TO 6
370 dice1=RND(6)
380 dice2=RND(6)
390 NEXT throw
400 ENDPROC
410 DATA "     ","  +  "
    ,"     "
420 DATA "+    ","     "
    ,"    +"
430 DATA "+    ","  +  "
    ,"    +"
440 DATA "+   +","     "
    ,"+   +"
450 DATA "+   +","  +  "
    ,"+   +"
460 DATA "+   +","+   +"
    ,"+   +"
```

Casting Agency

The Alien
VDU 23,226,60,126,219,231,
255,146,146,219

Fido the dog
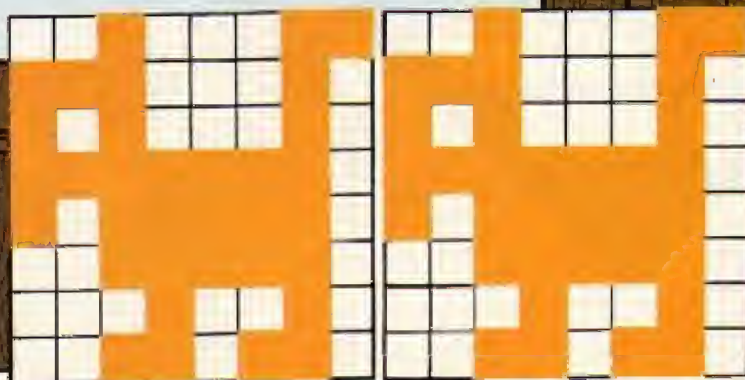
Rover the dog
VDU 23,227,35,226,162,254,
190,62,18,54
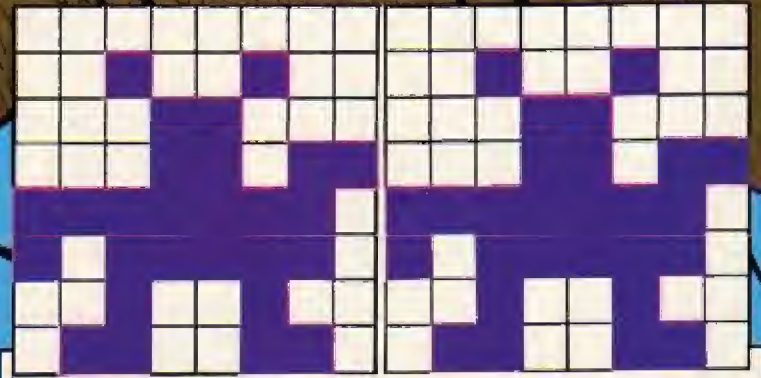
Jo the cat
VDU 23,224,36,24,27,254,
190,36,102,0

16
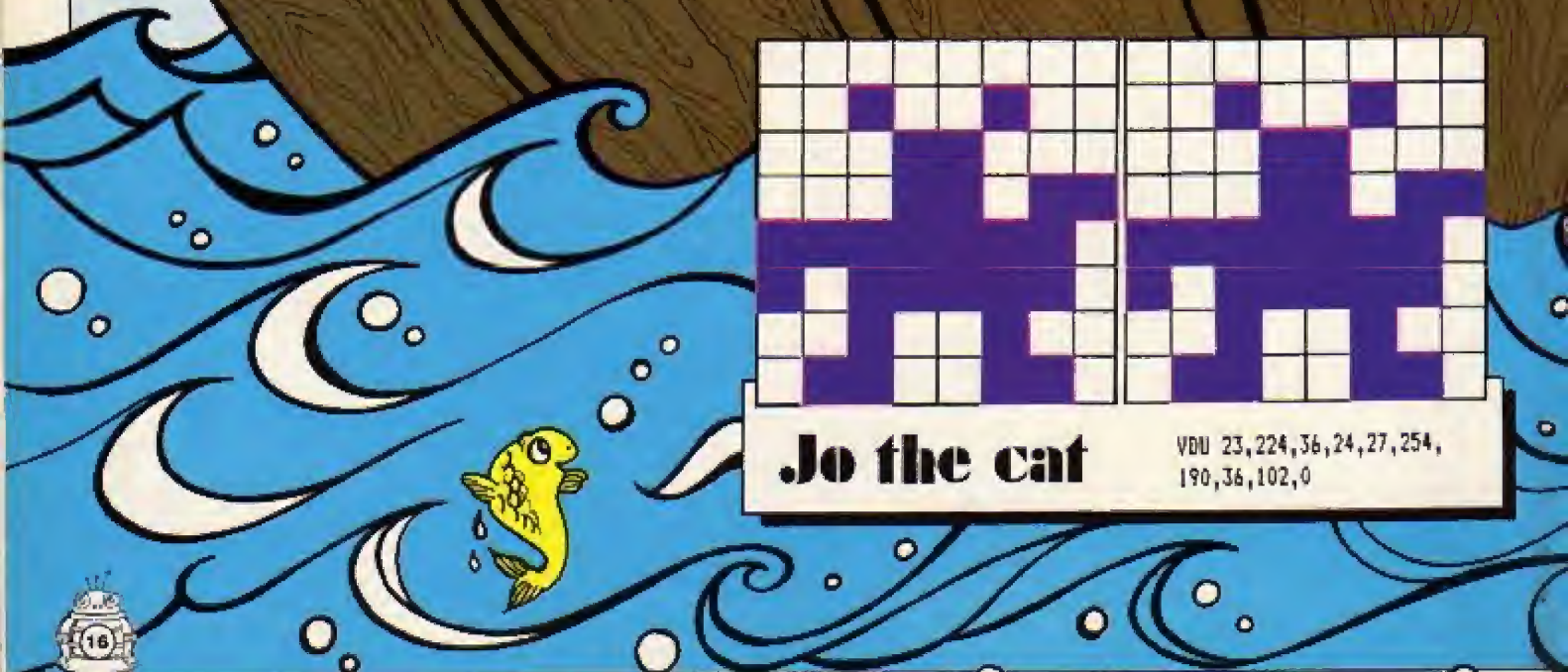
THIS month's Casting Agency features a whole Noah's Arkful of creatures devised by the girls of class 4S, Inglewood Junior School, Carlisle. So thanks from *Electron User* to Caroline, Margaret, Morven, Wendy, Tracy and Helen. (And a special thanks to Dawn whose shape didn't quite scrape in.)

At *Electron User* we're having fierce arguments about Fido and Rover. We know one of them is pedigree — we just can't agree which!
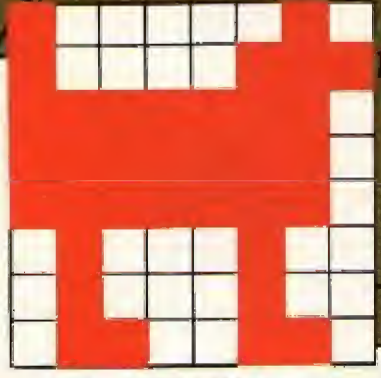
VDU 23,228,130,135,254,254, 254,68,68,102
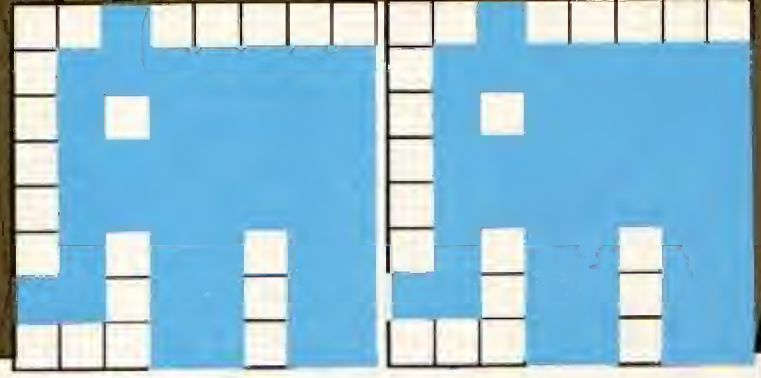
Dumbo the elephant

VDU 23,225,32,127,95,127, 127,91,219,27
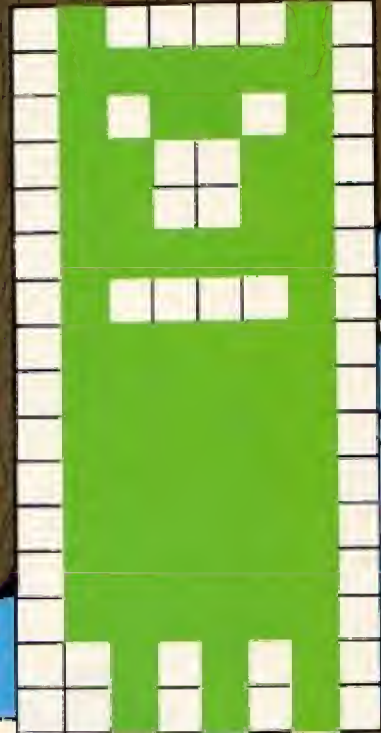
The Monster

VDU 23,229,66,126,90,102, 102,126,66,126

VDU 23,230,126,126,126, 126,126,42,42,0

Going
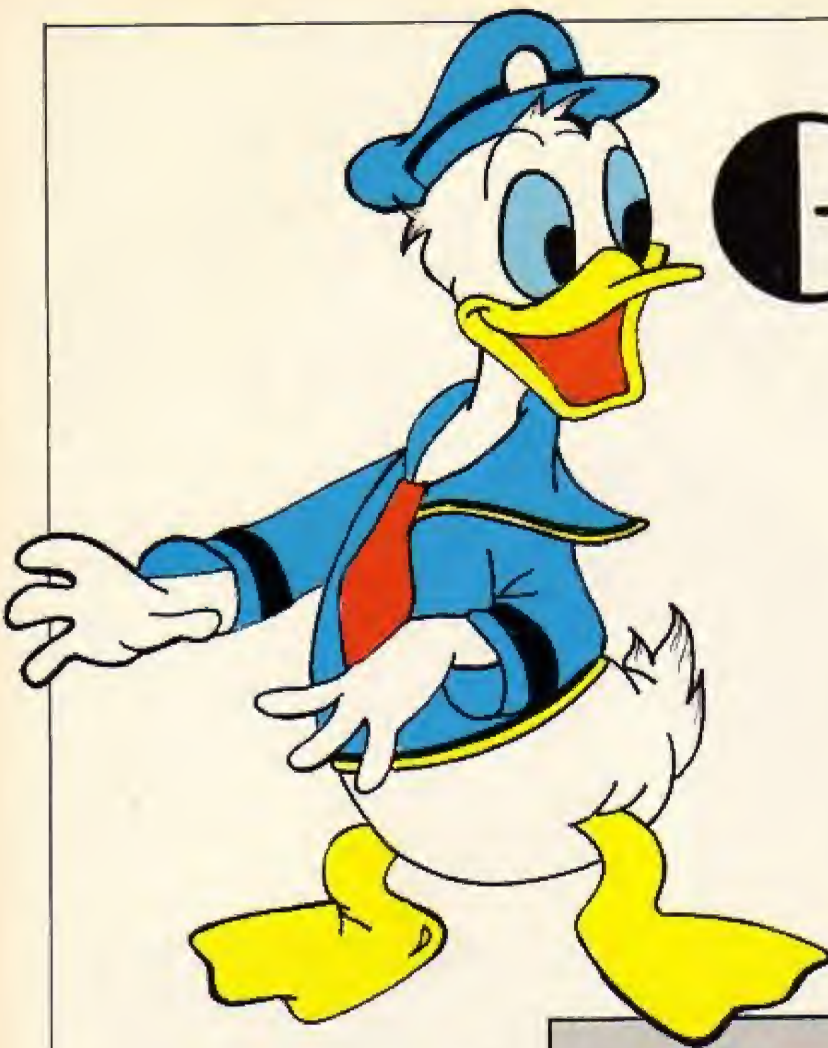
VDU 23,227,28,62,111,
255,255,255,126,60

Heads

VDU 23,228,60,126,219,
255,231,195,126,60

VDU 23,224,0,0,0,
1,15,1,2,4

VDU 23,225,0,0,0,
1,15,0,0,0
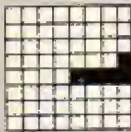
VDU 23,226,0,0,0,
0,24,60,0,0
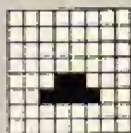
VDU 23,229,0,0,16,
0,0,0,0,0
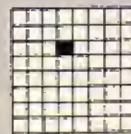
VDU 23,231,28,28,28,
63,127,255,255,255

VDU 23,232,255,255,
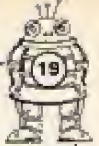102,0,0,0,0,0
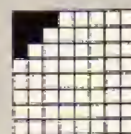
VDU 23 230,0,0,36,
0,0,0,0,0
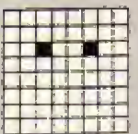
VDU 23,233,0,1,255,
255,255,255,255,255

VDU 23,234,224,192,
128,0,0,0,0,0

Quackers!

JOHN HARPER suggests a way to get your characters moving

HAVE you ever wondered how to make the characters from Casting Agency come alive?

Well, Quackers shows you one way of doing it.

The Electron User duck waddles across the screen by selective use of cleverly defined characters.

The listing uses lots of REM statements to explain how the program works.

Remember, you don't have to type the REMs in. They are there to help you — but your Electron ignores them.

Body Bits

VDU 23,235,96,224,192, 192,192,224,224,224

VDU 23,236,0,0,0,0,0, 0,16,48,112

```
10 REM (C) ELECTRON USER

20 REM JOHN HARPER
30 MODE 2
40 REM Cursor off------------
     ----------
50 VDU 23;8202;0;0;0;
60 REM Background blue-------
     ----------
70 VDU 18,0,132
80 REM Define shapes---------
     ----------
90 VDU 23,224,0,0,0,1,15
     ,1,2,4
100 VDU 23,225,0,0,0,1,15
     ,0,0,0
110 VDU 23,226,0,0,0,0,24
     ,60,0,0
120 VDU 23,227,28,62,111
     ,255,255,255,126,60
130 VDU 23,228,60,126,219
     ,255,231,195,126,60
140 VDU 23,229,0,0,16,0
     ,0,0,0,0
150 VDU 23,230,0,0,36,0
     ,0,0,0,0
160 VDU 23,231,28,28,28
     ,63,127,255,255,255
170 VDU 23,232,255,255,102
     ,0,0,0,0,0
180 VDU 23,233,0,1,255,255
     ,255,255,255,255
190 VDU 23,234,224,192,128
     ,0,0,0,0,0
200 VDU 23,235,96,224,192
     ,192,192,224,224,224
210 VDU 23,236,0,0,0,0,0
     ,16,48,112
220 CLG
230 X=15
     :Y=10
240 REM Print duck as text
     on blue text background
     with alternate beaks
     and delay before erasure
     and print of next compos
     ite--------

250 REPEAT
260 ENVELOPE 1,2,2,2,2,0
     ,9,8,126,0,0,-126,126
     ,126
270 SOUND &0011,1,40,4
280 REM Move print position
     of duck----
290 VDU 31,X,Y
300 VDU 17,132
310 VDU 17,3,224,17,2,227
     ,10,8,17,0,231,233,11
     ,236,10,8,235,10,8,234
     ,8,8,8,232,232
320 PROCDelay
330 VDU 9,127,127,127,11
     ,9,9,9,127,127,127,11
     ,9,9,9,127,127,127,127
340 VDU 8,17,3,225,17,2
     ,227,10,8,17,0,231,233
     ,11,236,10,8,235,10
     ,8,234,8,8,8,232,232

350 PROCDelay
360 VDU 9,127,127,127,11
     ,9,9,9,127,127,127,11
     ,9,9,9,127,127,127,127
370 X=X-2
     :IF X<0
     THEN X=X+19
380 REM Value of A,split
     point,and resultant
     values of Y will determi
     ne degree of bias in
     upward or downward
     movement---
390 A=RND(6)
400 IF A<3
     THEN Y=Y-RND(3)
410 IF A>=3
     THEN Y=Y+RND(2)
     :IF Y>=28
     THEN Y=1
420 UNTIL FALSE
430 DEF PROCDelay
440 FOR A=1TO 235
450 NEXT
460 ENDPROC
```

Zip pah doodle


```
Drawing :
Use the cursor keys
Mirror effect drawing :
Press 'B' once
Return to single line drawing :
Press 'V' once
Clear Screen :
Press 'C' once
Fanning :
Press 'M' once
double Fanning,'B' once
and then
Press 'M' once
Return to single Fanning :
Press 'V' once
Return to Mirror effect Drawing :
Press 'N' once
Return to,Single Line Drawing :
Press 'V' once and then
Press 'M' once
Return to,INSTRUCTIONS :
Press 'ESCAPE' once
TO ESCAPE FROM PROGRAM :
PRESS <BREAK> ONCE

PRESS ANY KEY FOR COLOUR CONTROLS
```


COLOUR	:	FOREGROUND PRESS	:	BACKGROUND PRESS
BLACK	:	1	:	Q
RED	:	2	:	W
GREEN	:	3	:	E
YELLOW	:	4	:	R
BLUE	:	5	:	T
MAGENTA	:	6	:	Y
CYAN	:	7	:	U
WHITE	:	8	:	I

PRESS ANY KEY TO D O O D L E

By MARK WHITHAM

DOODLE BUG allows you to use your Electron as an electronic sketch pad.

With it you can create an unlimited number of colourful patterns.

It's relaxing — and it's fun!

```
10 REM (C) ELECTRON USER
20 ON ERROR MODE 1
   :PROCINST
   :GOTO 40
30 MODE 1
   :PROCHEADER
   :PROCINST
40 N=130
50 C=0
60 MODE 0
70 VDU 5
80 *FX15,1
90 CLG
100 MOVE 640,500
110 X=600
    :Y=500
120 PLOT 69,X,Y
130 Y1=Y
    :X1=X
140 IF INKEY (-58)
    THEN Y=Y+15
    :GOTO 390
150 IF INKEY (-42)
    THEN Y=Y-15
    :GOTO 390
160 IF INKEY (-26)
    THEN X=X-15
    :GOTO 390
170 IF INKEY (-122)
    THEN X=X+15
    :GOTO 390
180 IF INKEY (-50)
    THEN VDU 19,1,1;0;
    :GOTO 140
190 IF INKEY (-18)
    THEN VDU 19,1,2;0;
    :GOTO 140
200 IF INKEY (-19)
    THEN VDU 19,1,3;0;
    :GOTO 140
210 IF INKEY (-20)
    THEN VDU 19,1,4;0;
    :GOTO 140
220 IF INKEY (-53)
    THEN VDU 19,1,5;0;
    :GOTO 140
230 IF INKEY (-37)
    THEN VDU 19,1,6;0;
    :GOTO 140
240 IF INKEY (-22)
    THEN VDU 19,1,7;0;
    :GOTO 140
250 IF INKEY (-49)
    THEN VDU 19,1,0;0;
    :GOTO 140
260 IF INKEY (-83)
    THEN 90
270 IF INKEY (-86)
    THEN N=130
    :GOTO 460
280 IF INKEY (-102)
    THEN N=140
    :GOTO 460
290 IF INKEY (-34)
    THEN VDU 19,0,1;0;
    :GOTO 130
300 IF INKEY (-35)
    THEN VDU 19,0,2;0;
    :GOTO 130
310 IF INKEY (-52)
    THEN VDU 19,0,3;0;
    :GOTO 130
320 IF INKEY (-36)
    THEN VDU 19,0,4;0;
    :GOTO 130
330 IF INKEY (-69)
    THEN VDU 19,0,5;0;
    :GOTO 130
340 IF INKEY (-54)
    THEN VDU 19,0,6;0;
    :GOTO 130
350 IF INKEY (-38)
    THEN VDU 19,0,7;0;
    :GOTO 130
360 IF INKEY (-17)
    THEN VDU 19,0,0;0;
    :GOTO 130
370 IF INKEY (-101)
    THEN C=1
380 IF INKEY (-100)
    THEN C=0
390 IF X<10
    THEN X=10
400 IF X>1200
    THEN X=1200
    ELSE IF C=1 AND X>600
    X=600
410 IF Y<10
    THEN Y=10
420 IF Y>1000
    THEN Y=1000
430 DRAW X,Y
440 IF C=1 MOVE 1200-X1
    ,Y1
    :DRAW 1200-X,Y
    :MOVE X,Y
450 GCOL 0,7
    :DRAW X1,Y1
460 GOTO N
470 DEF PROCINST
480 *FX15,0
490 VDU 23;8202;0;0;0;
500 COLOUR 1
510 PRINT TAB(8,4)" D D
      O D L E   B U G "
520 COLOUR 2
530 PRINT ''"This program
      enables the user to
      draw"''"on the screen,u
      sing straight lines."
540 PRINT ''''
550 COLOUR 3
560 PRINT "  PRESS ANY
      KEY FOR CONTROLS
```

de doodle,
all day!
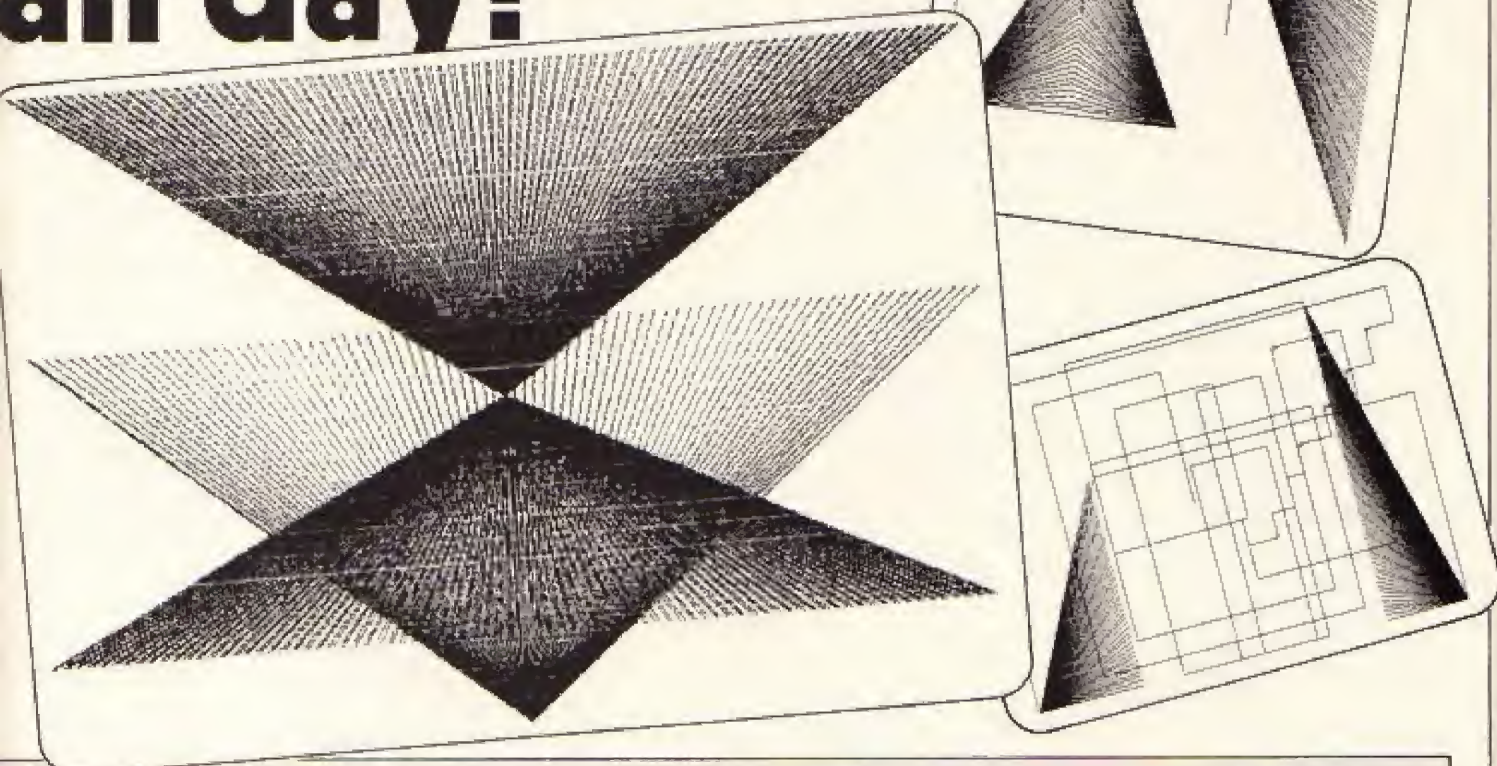

```
       ";
570 A$=GET$
    :CLS
580 COLOUR 3
    :PRINT 'TAB(8);"
    Drawing      : "
590 COLOUR 2
    :PRINT TAB(8);" Use
    the cursor keys"
600 COLOUR 3
    :PRINT TAB(6);" Mirror
    effect drawing : "
610 COLOUR 2
    :PRINT TAB(11)"Press
    'B' once"
620 COLOUR 3
    :PRINT TAB(2);" Return
    to single line drawing
    :"
630 COLOUR 2
    :PRINT TAB(11)"Press
    'V' once"
640 COLOUR 3
    :PRINT TAB(8);" Clear
    Screen  : "
650 COLOUR 2
    :PRINT TAB(11)"Press
    'C' once "
660 COLOUR 3
    :PRINT TAB(8);"
    Fanning     : "
```

```
670 COLOUR 2
    :PRINT TAB(11)"Press
    'M' once"
680 COLOUR 3
    :PRINT TAB(8);" Double
    Fanning : "
690 COLOUR 2
    :PRINT TAB(5)"Press
    'M' and then 'B'
    once"
700 COLOUR 3
    :PRINT TAB(4);" Return
    to single Fanning
    : "
710 COLOUR 2
    :PRINT TAB(11)"Press
    'V' once"
720 COLOUR 3
    :PRINT TAB(0);" Return
    to Mirror effect Drawi
    no : "
730 COLOUR 2
    :PRINT TAB(11)"Press
    'N' once"
740 COLOUR 3
    :PRINT TAB(2);"Return
    to Single Line Drawing
    : "
750 COLOUR 2
    :PRINT TAB(5)"Press
    'N' and then 'V'
```

```
    once"
760 COLOUR 3
    :PRINT TAB(3);" Return
    to INSTRUCTIONS : "
770 COLOUR 2
    :PRINT TAB(9)"Press
    'ESCAPE' once"
780 COLOUR 3
    :PRINT TAB(5);" TO
    ESCAPE FROM PROGRAM
    : "
790 COLOUR 2
    :PRINT TAB(10);"PRESS
    <BREAK> ONCE"
800 COLOUR 1
    :PRINT '''"PRESS ANY
    KEY FOR COLOUR CONTROL
    S";
810 A$=GET$
    :CLS
820 COLOUR 1
    :PRINT '" COLOUR
    | FOREGROUND | BACKGRO
    UND"'"       |
    PRESS  :  PRESS"
    :COLOUR 2
830 RESTORE
    :FOR I=1TO 8
    :READ C$,FK$,BK$
840 PRINT TAB(3,(4+(I*2)));
    C$;;TAB(11,(4+(I*2)));
```

```
    ":   ";FK$;TAB(24
    ,(4+(I*2)));"|
    ";BK$
850 NEXT
860 COLOUR 3
    :PRINT ''TAB(2)" PRESS
    ANY KEY TO D O O D
    L E "
870 A$=GET$
    :ENDPROC
880 DATA BLACK,1,Q,RED
    ,2,W,GREEN,3,E,YELLOW
    ,4,R,BLUE,5,T,MAGENTA
    ,6,Y,CYAN,7,U,WHITE
    ,8,I
890 DEF PROCHEADER
900 VDU 23;8202;0;0;0;
910 COLOUR 2
    :PRINT ''"
    D O O D L E   B U
    G "
920 COLOUR 3
    :PRINT '''TAB(18);
    "by"
930 COLOUR 1
    :PRINT '''TAB(12);
    "Mark Whitham"
940 TIME =0
    :REPEAT UNTIL TIME >500
    :CLS
    :ENDPROC
```

Compile your own Buzz Word Generator

Inscrutable vectoriser Mike Cook obfuscates excessive integers

HOW many times have you searched for that certain phrase that will impress your boss? Maybe you are thinking of becoming a technocrat. Or perhaps you are trying to write an impressive advertisement.

Not to worry, help is at hand in the form of The Electron User Buzz-Word Generator.

With this you can produce phrase after phrase of impressive-sounding technical jargon.

The only snag is it might not mean all that much. But that doesn't seem to put off many people, so why should you bother?

The program works by gathering words from three groups of data statements into an array. This is done in lines 10-100.

These are placed into the two-dimensional string variable WORDS. The first two groups consist of adjectives and the third of nouns.

A note of how many words are in each group is kept in the array called MAX.

This structure is used to allow you to add your own words without the need to alter any of the program.

Lines 110-210 generate the phrase from the buzz words by picking a random word out of each group.

Line 160 prints out a single word from one of the groups and, as it is in a FOR/NEXT loop, it will do this for each of them.

The words used to form the phrases are held in data statements in lines 220-340.

Each group finishes with a DATA statement containing a null string. These are lines 250, 290 and 340.

A null string is a string with nothing in it, as indicated by the two quotation marks being next to each other (note no space).

This is the same as the string in line 80. If a space is typed here then the program will not work properly.

To add your own words, just insert extra lines with DATA statements containing your new words.

For example, if you want to add more nouns (third group) add your extra lines between lines 300 and 340.

If you run out of line numbers you can always renumber the program with the RENUMBER command.

You will find many a good phrase generated. One that I like a lot is: "Synchronised reciprocal concept." It sounds great, even though I haven't a clue what it means.

But, as I said, since when did that stop anybody using a phrase?

Of course, it's your integrated flexibility contingency that's causing the problem

No dear. I just haven't plugged it in yet, that's all!

```
10 REM THE ELECTRON USER
   BUZZ-WORD GENERATOR
20 DIM WORD$(3,100),MAX(3)
30 FOR AZ=1 TO 3
40 MZ=0
50 REPEAT
60 MZ=MZ+1
70 READ WORD$(AZ,MZ)
80 UNTIL WORD$(AZ,MZ)=
   ""
90 MAX(AZ)=MZ-1
100 NEXT
110 REPEAT
120 CLS
130 PRINT TAB(0,4);"BUZZ-WO
    RD GENERATOR"
140 PRINT TAB(0,10)
150 FOR AZ=1 TO 3
160 PRINT WORD$(AZ,
    RND(MAX(AZ)));" ";
170 NEXT
180 PRINT
190 PRINT TAB(0,20);"PRESS
    ANY KEY FOR ANOTHER
    PHRASE"
200 AZ=GET
210 UNTIL FALSE
220 DATA INTEGRATED,SYNCHRO
    NISED,RESPONSIVE,PARALL
    EL,BALANCED
230 DATA TOTAL,FUNCTIONAL
    ,USER-FRIENDLY
240 DATA OPTIMAL,COMPATIBLE
    ,NEW,.SIXTEEN-BIT
250 DATA ""
260 DATA MANAGERIAL,ORGANIS
    ATIONAL,MONITORED
270 DATA RECIPROCAL,DIGITAL
    ,LOGISTICAL
280 DATA TRANSITIONAL
    ,INCREMENTAL,FIFTH-GENE
    RATION
290 DATA ""
300 DATA POLICY,OPTIONS
    ,FLEXIBILITY
310 DATA CAPABILITY,MOBILIT
    Y,PROGRAMMING
320 DATA CONCEPT,TIME-PHASE
    ,PROJECTION
330 DATA HARDWARE,SOFTWARE
    ,CONTINGENCY
340 DATA ""
```

SOUNDS..

EXCITING

BUILD up a library of exciting sounds to
enhance your own programs with these
listings. And many more in the months to come!

ALARM

```
ENVELOPE 1,5,1,2,80,15,
0,0,126,0,0,-126,126,126

SOUND 1,1,280,100
```

ROAD WORKS

```
ENVELOPE 5,1,70,16,0,31,
0,0,126,0,0,-126,126,126

SOUND 0,5,80,200
```
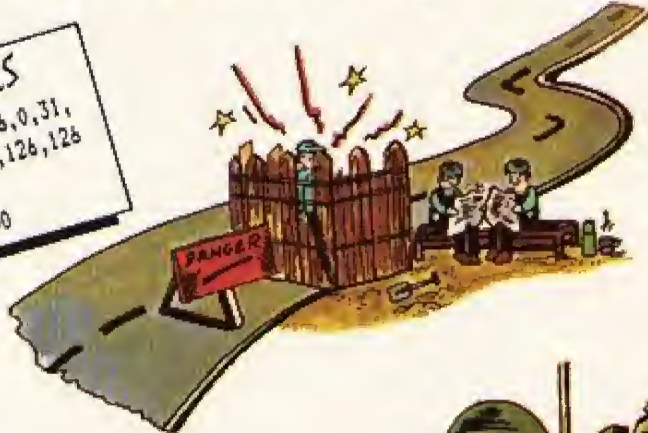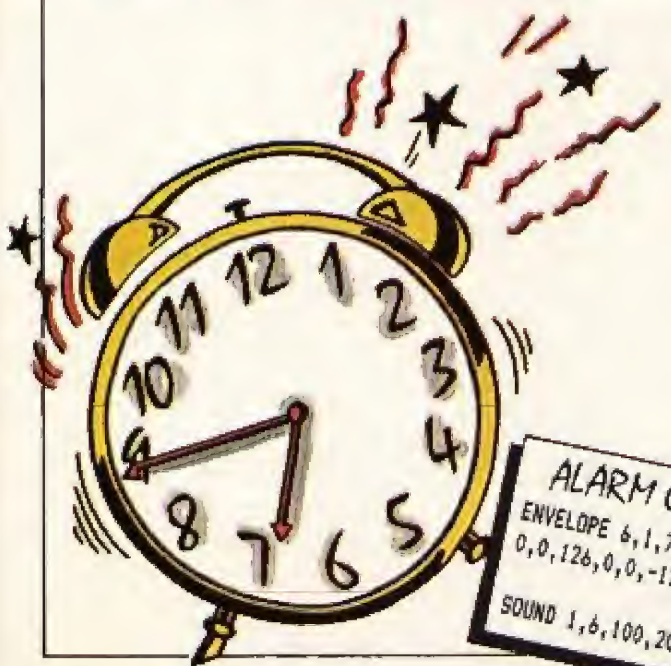
WARSHIP'S SIREN

```
ENVELOPE 2,1,5,0,0,25,
0,0,126,0,0,-126,126,126

SOUND 1,2,40,12
```

MACHINE GUN

```
ENVELOPE 3,3,6,4,6,2,
0,0,126,0,0,-126,126,126

SOUND 1,3,4,48
```

THE MARTIANS APPROACH

```
ENVELOPE 4,12,10,8,6,4,
0,0,126,0,0,-126,126,126

SOUND 0,4,4,40
```

ALARM CLOCK

```
ENVELOPE 6,1,70,16,2,2,
0,0,126,0,0,-126,126,126

SOUND 1,6,100,200
```

NOW – LET'S HEAR WHAT YOU CAN DO

Send your own exciting sounds to: Sounds
Exciting, Electron User, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

Graphics

Make it fair and SQUARE

SHOW your mastery of the keyboard with this program which draws squares of varying size and colour. Amaze your friends with your graphical dexterity!

The program produces a series of squares on the screen. You decide where they go, what size they are and how fast you can move them around.

The keys I, J, L and M are used to manoeuvre the squares, S to shrink them and E to enlarge them.
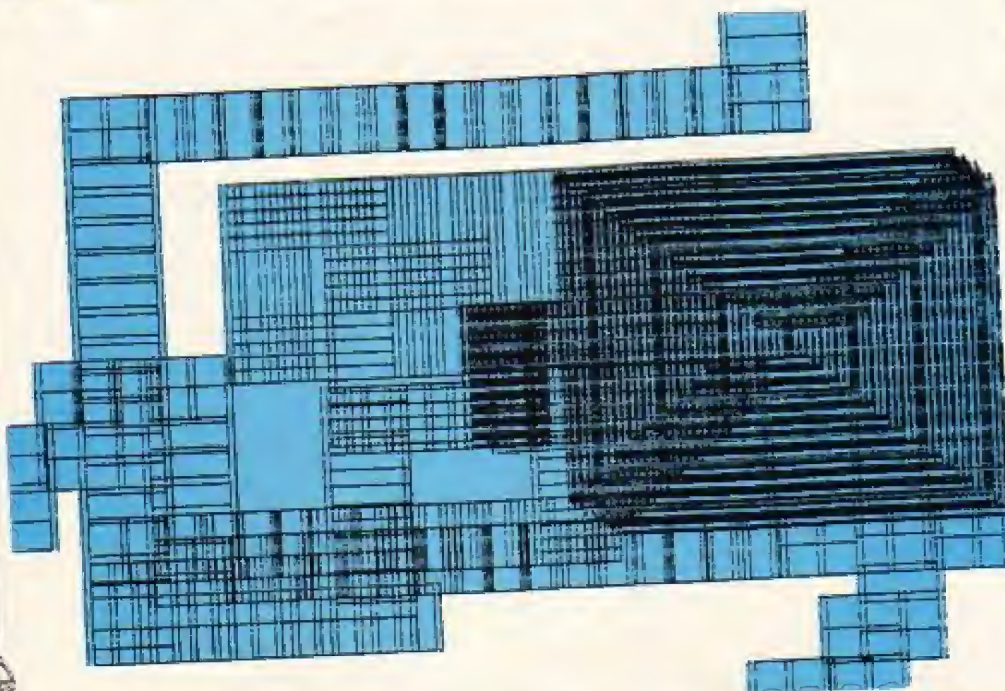
The < and > keys decrease and increase the speed of movement of the squares.

When you want to clear the screen and start again just press the Space bar. And if you ever have enough then press the Break key.

You would also be advised to press the key marked f0 as line 60 of the listing changes the response of your keyboard.

Pressing the f0 key sets things back to rights.

```
10 REM SQUARES
20 REM (C)ELECTRON USER
30 *KEY 0*FX11,60!M
40 MODE 1
   :VDU 23;8202;0;0;0;
50 PRINT ''''''"Press C for col
   ours otherwise any key..."
60 FLA%=(INSTR("NC",
   GET$)=2)
   :ACC%=5
   :SPE%=20
   :X%=500
   :Y%=500
   :SIZ%=100
   :*FX 11,1
70 CLS
   :REPEAT
80 PROCDrawaSquare(X%,Y%)
90 PROCCheckKeys
100 IF FLA% VDU 19,
    RND(3),RND(15);0;
110 UNTIL FALSE
120 DEF PROCDrawaSquare(X%
    ,Y%)IF FLA% GCOL
    RND(3),RND(3)
130 VDU 29,X%;Y%;
140 MOVE SIZ%,SIZ%
150 DRAW SIZ%,-SIZ%
160 DRAW -SIZ%,-SIZ%
170 DRAW -SIZ%,SIZ%
180 DRAW SIZ%,SIZ%
190 ENDPROC
200 DEF PROCCheckKeys
    :KEY$=INKEY$ (0)
    :*FX 15
210 IF KEY$="I" Y%=Y%+SPE%
    :IF Y%>1023 Y%=0
220 IF KEY$="J" X%=X%-SPE%
    :IF X%<0 X%=1279
230 IF KEY$="M" Y%=Y%-SPE%
    :IF Y%<0 Y%=1023
240 IF KEY$="L" X%=X%+SPE%
    :IF X%>1279 X%=0
250 IF KEY$="E" SIZ%=SIZ%+SPE%
    :IF SIZ%>999 SIZ%=999
260 IF KEY$="S" SIZ%=SIZ%-SPE%
    :IF SIZ%<50 SIZ%=50
270 IF KEY$="." SPE%=SPE%+ACC%
    :IF SPE%>200 SPE%=200
280 IF KEY$="," SPE%=SPE%-ACC%
    :IF SPE%<5 SPE%=5
290 IF KEY$=" " CLS
300 ENDPROC
```

Run rings round your Electron – in 3D
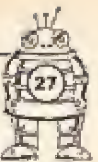
AS you might guess, Iron Ring uses your Electron's graphics to depict a ring on the screen. As it's in Mode 0 you get no colour but what you do get is a marvellours three dimensional effect.

Despite the fact that it appears solid it is actually just a circular series of ellipses drawn over each other, each one slightly offset.
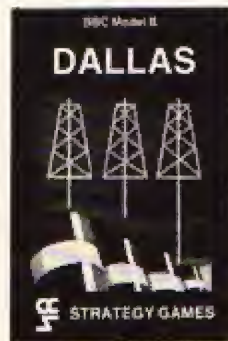
Aren't these micros wonderful?
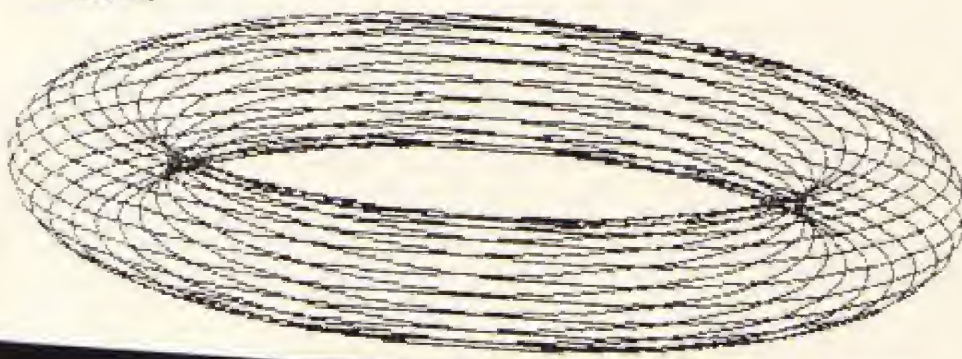

```
10 REM IRON RING
20 REM (C)ELECTRON USER
30 MODE 0
   :VDU 23;8202;0;0;0;
40 FOR G=0 TO 6.3
   STEP .3
50 VDU 29,640+SIN (G)*100;
   512+COS (G)*100;
60 MOVE 0,150
70 FOR F=0 TO 6.3
   STEP 0.1
80 DRAW SIN (F)*500,
   COS (F)*150
90 NEXT
100 NEXT
110 REPEAT UNTIL FALSE
```
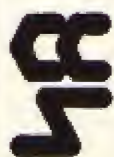
Try this geographical quiz from NORMAN PARR. It also offers techniques you can incorporate into your own programs.

THIS program draws a map of Europe and then sets up a test situation. It illustrates the use of MOVE and PLOT commands, the drawing of text windows and printing at the graphics cursor.

The majority of the program is taken up by data statements.

These largely contain the X and Y co-ordinates needed to draw the map.

The Electron has a screen divided into 1280 X and 1024 Y co-ordinates and it is necessary to locate each mapping point within these parameters.

If you want to draw a map the first thing to do is to select a map with a suitable scale.

This one was first traced out of an atlas and then a grid, drawn on tracing paper, was placed over it.

Each grid line has to be numbered and it is these numbers that provide the co-ordinates.

In this case the grid was numbered 0 to 220 on the X axis and 40 to 230 on the Y axis.

It is not necessary to plot an excessive number of points but the basic shape of the area must not be lost.

The points used in this program and the grid lines are shown on the now simplified map of Europe. In all there are 441 co-ordinates.

The next step is to set up two arrays to carry the co-ordinates. These are X% and Y% and each is dimensioned at the start of the program.

The data statements are then read into the arrays and at the same time each is multiplied by 4.

The co-ordinates could

have been read from the map as the final numbers, but this would have made an already tedious task even more difficult.

The map extremities are now 880 and 920 respectively.

It is then straightforward to use MOVE and PLOT 5 (DRAW) to produce the map.

The only problem is that the map is not a continuous line. Each part of the program is separated into sections, with a MOVE statement shifting the cursor to its new starting point each time. REM statements indicate the appropriate sections.

The rest of the program uses the map to develop a test

based on seas. The variable NAMES is used to hold the names of the water areas.

These are READ out of data at the end of the program. TESTX and TESTY carry the co-ordinates for plotting an asterisk marking the area on the map under examination.

VDU28 is used to set up a text window in which the questions are asked. This area is coloured white with COLOUR 129:CLS in line 500.

As each question is asked the appropriate question number and an asterisk appear on the map.

This is done by using VDU5 which separates the text and graphics cursors, allowing printing to be done at the graphics cursor.

VDU4 must be used

immediately afterwards to rejoin the cursors to write inside the text window. A question mark appears on the screen (line 620) prompting an answer.

ANSWERS is then compared with the relevant NAMES. A simple variable RIGHT counts the success rate.

At the end of the test a score is given and the correct answers are printed on the map to check errors.

This printing is again done using VDU5 and 4. Note the extra 60 put on the X co-ordinate to move the name to the right of the asterisk to prevent over-plotting.

This particular test is obviously very short and only serves to illustrate a technique.

It would be possible to test other aspects of Europe, for example capitals, countries and rivers using similar methods.

A series of such tests could be stored on tape or disc and the chosen test fed in under program control.

NAME THE SEA
SHOWN BY A
*
TYPE IN YOUR
ANSWER
THEN PRESS
RETURN
?
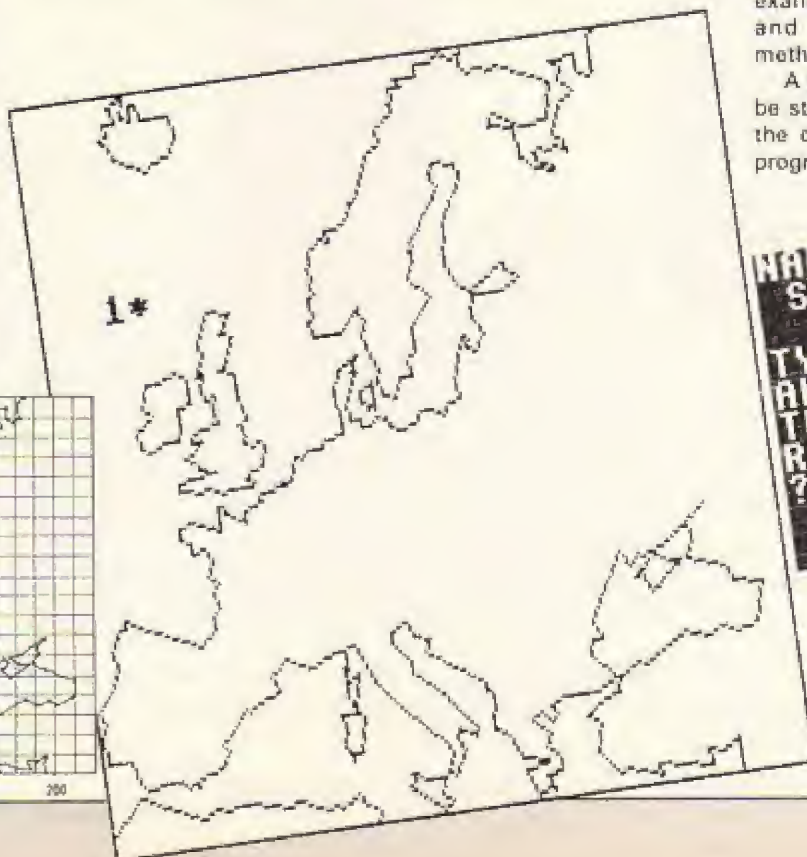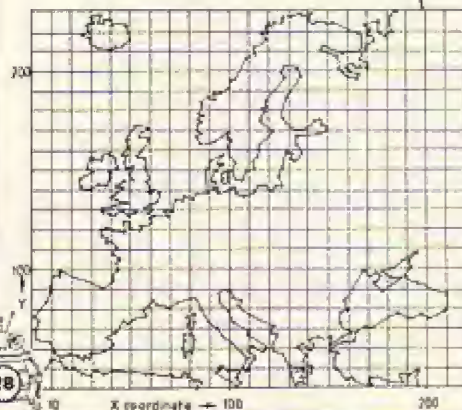
```
10 REM EUROMAP
20 REM By Norman Parr
30 MODE 4
40 ON ERROR GOTO 810
50 VDU 23;8202;0;0;0;
60 DIM X%(441)
   :DIM Y%(441)
   :DIM NAME$(5)
70 DIM TESTX(5)
   :DIM TESTY(5)
80 REM *** READ X CO-ORDINAT
   ES ***
90 FOR I%=1TO 441
   :READ X%(I%)
   :X%(I%)=X%(I%)*4
   :NEXT
100 REM *** READ Y CO-ORDINAT
    ES ***
110 FOR I%=1TO 441
    :READ Y%(I%)
    :Y%(I%)=Y%(I%)*4
    :NEXT
120 REM *** LOOP TO READ
    TEST DATA ***
130 FOR J=1TO 5
140 READ NAME$(J)
150 READ TESTX(J)
    :TESTX(J)=TESTX(J)*4
160 READ TESTY(J)
    :TESTY(J)=TESTY(J)*4
170 NEXT J
180 RIGHT=0
190 REM *** COLOUR 0 TO
    BLUE ***
200 VDU 19,0,4,0,0,0
210 REM *** DRAW MAP FRAME
    ***
220 MOVE 0,160
230 DRAW 0,920
    :DRAW 880,920
    :DRAW 880,160
    :DRAW 0,160
240 REM *** AFRICA ***
250 MOVE 0,45*4
260 FOR I%=1TO 24
270 PLOT 5,X%(I%),Y%(I%)
280 NEXT
290 REM *** MAIN COASTLINE
    ***
300 MOVE 198*4,160
310 FOR I%=25TO 330
    :PLOT 5,X%(I%),Y%(I%)
320 NEXT
330 REM *** SICILY ***
340 MOVE 416,164
    :FOR I%=331TO 340
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
350 REM *** SARDINIA ***

360 MOVE 312,224
    :FOR I%=341TO 348
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
370 REM *** CORSICA ***
380 MOVE 324,276
    :FOR I%=349TO 353
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
390 REM *** SJAELLAND ***
400 MOVE 392,572
    :FOR I%=354TO 359
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
410 REM *** ICELAND ***
420 MOVE 120,856
    :FOR I%=360TO 377
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
430 REM *** UK ***
440 MOVE 236,512
    :FOR I%=378TO 426
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
450 REM *** IRELAND ***
460 MOVE 116,560
    :FOR I%=427TO 441
    :PLOT 5,X%(I%),Y%(I%)
    :NEXT
470 REM *** SET UP TEXT
    WINDOW ***
480 VDU 28,28,20,39,11
490 REM *** COLOUR WINDOW
    WHITE ***
500 COLOUR 129
    :CLS
510 REM *** WRITE IN BLUE
    ***
520 COLOUR 0
530 REM *** TEST ***
540 PRINT "NAME THE SEA SHOWN
    BY A      *"
550 FOR J=1TO 5
560 VDU 5
570 J$=STR$ (J)
580 MOVE TESTX(J),TESTY(J)
    :PRINT J$"*"
590 VDU 4
600 PRINT "TYPE IN YOURANSWER
    "
610 PRINT "THEN PRESS  RETURN
```

```
    "
620 INPUT ANSWER$
630 IF ANSWER$=""
    THEN 620
640 IF ANSWER$=NAME$(J)

    THEN RIGHT=RIGHT+1
650 PRINT
660 PROCkey
670 NEXT
680 PRINT "YOUR SCORE =
    "RIGHT;" OUT OF 5"
690 PRINT
700 IF RIGHT=5
    THEN PRINT "WELL DONE!"
710 PROCkey
720 PRINT "CHECK"
730 PRINT "ANSWERS"
740 PRINT
750 FOR I=1TO 5
760 VDU 5
770 MOVE TESTX(I)+60,TESTY(I)
    :PRINT NAME$(I)
780 VDU 4
790 PROCkey
800 NEXT
810 VDU 20
    :VDU 26
    :CLS
820 GOTO 180
830 REM ****X COORDS ********
840 REM *** AFRICA ***
850 DATA 0,10,14,17,21,25
    ,30,31,33,37
860 DATA 40,43,52,54,61
    ,64,68,70,72,75
870 DATA 78,80,84,83
880 REM *** BLACK SEA ***
890 DATA 198,193,188,189
    ,172,173,163
900 DATA 160,154,156,152
    ,158,163,164
910 DATA 170,173,186,193
    ,198,202,209
920 DATA 212,203,201,190
    ,192
930 DATA 191,197,183,178
    ,184,188,182
940 DATA 178,175,173,178
    ,175,172,169
950 DATA 158,160,157,156
```
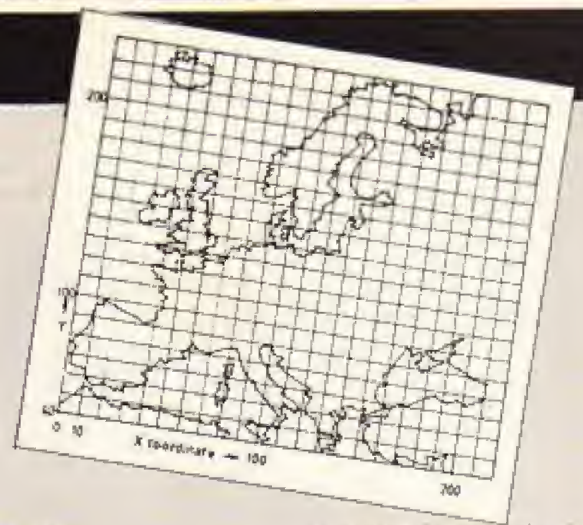
```
    ,163,156,152
960 REM *** GREECE/YUGOSLAVIA
    ***
970 DATA 145,141,143,141
    ,138,135,140
980 DATA 138,142,142,140
    ,140,137,139
990 DATA 137,134,131,138
    ,138,130,127
1000 DATA 123,124,122,122
     ,105,107,102
1010 DATA 100
1020 REM *** ITALY ***
1030 DATA 97,95,95,100,100
     ,103,110,110
1040 DATA 118,117,112,111
     ,113,109,107
1050 DATA 109,107,102,96
     ,93,89,83,73
1060 REM *** S. FRANCE/SPAIN
     ***
1070 DATA 69,63,61,59,56
     ,58,51,48,47,42
1080 DATA 38,40,37,30,29
     ,27,26,24,19,13
1090 DATA 11,9,2,1,3,1,7
     ,9,8,11,13,13,15
1100 DATA 36,41
1110 REM *** FRANCE ***
1120 DATA 41,43,42,44,41
     ,43,41,37,37,34
1130 DATA 34,38,41,47,47
     ,49,49,55,55,61
1140 DATA 60,61,69
1150 REM *** FRANCE - BALTIC
     COAST ***
1160 DATA 68,71,73,75,77
     ,80,82,83,89,88
1170 DATA 90,90,97,94,96
     ,93,91,92,92,95
1180 DATA 95,98,100,102,103
     ,104,107,112
1190 DATA 114,118
1200 REM *** BALTIC/SCANDINAVI
     A ***
1210 DATA 121,123,127,126
     ,127,130,132
1220 DATA 131,134,137,134
     ,135,145,150
1230 DATA 146,146,143,141
     ,134,131,128
1240 DATA 129,136,135,128
     ,127,129,126
1250 DATA 118,119,117,118
     ,116,122,115
1260 DATA 115,112,113,109
     ,107,103,102
```

From Page 29

```
1270 DATA 103,101,99,101
     ,99,99
1280 DATA 97,93,84,83,85
     ,84,84,86,85,86
1290 DATA 85,86,86,90,93
     ,92,96,100,101
1300 DATA 103,109,113,112
     ,118,117,119
1310 DATA 118,122,120,123
     ,127,127,131
1320 DATA 135,138,142,141
     ,143,146,150
1330 DATA 152,168,166,158
     ,149,147,155
1340 DATA 156,158,160,166
     ,166,162,160
1350 DATA 162,165,167,171
     ,170
1360 DATA 167,171,175,171
     ,172,169,177
1370 DATA 177,180,182,182
     ,185
1380 REM *** SICILY ***
1390 DATA 100,94,96,95,97
     ,99,106,104
1400 DATA 107,104
1410 REM *** CORSICA/SARDINIA
     ***
1420 DATA 76,77,76,82,83
     ,81,78,78,79
1430 DATA 80,79,83,81
1440 REM *** SJAELLAND ***
1450 DATA 97,96,96,100,100
     ,97
1460 REM *** ICELAND ***
1470 DATA 29,26,29,28,32
     ,30,35,34,37,37
1480 DATA 39,40,49,50,47
     ,42,40,30
1490 REM *** UK ***
1500 DATA 52,49,45,41,39
     ,36,36,41,48,43
1510 DATA 42,39,42,45,42
     ,43,46,51,50,51
1520 DATA 48,47,48,48,46
     ,49,48,50,52,59
1530 DATA 55,59,55,53,58
     ,58,60,57,58,59
1540 DATA 58,60,62,64,63
     ,59,57,60,59
1550 REM *** IRELAND ***
1560 DATA 26,25,31,28,30
     ,35,36,40,43,43
1570 DATA 39,39,38,34,29
1580 REM ***
1590 REM ***
```

```
1600 REM *** Y COORDS ***
1610 DATA 45,54,53,51,50
     ,48,47,48,49,48
1620 DATA 49,49,48,47,48
     ,46,45,46,45,46
1630 DATA 48,45,43,40
1640 DATA 49,46,47,43,45
     ,42,45,44,50,57
1650 DATA 59,63,64,68,71
     ,70,77,75,77,75
1660 DATA 77,87,88,92,95
     ,100,104,108,99
1670 DATA 98,95,95,91,88
     ,93,92,96
1680 DATA 98,95,99,83,78
     ,78,74,68,65,65
1690 REM *** GREECE/YUGOSLAVIA
     ***
1700 DATA 65,63,61,59,62
     ,60,56,53,50
1710 DATA 47,47,46,46,42
     ,43,41,48,49,50
1720 DATA 51,57,59,68,69
     ,71,81,84,85,89
1730 REM *** ITALY ***
1740 DATA 88,87,84,79,76
     ,74,69,68,60,58
1750 DATA 61,58,55,49,50
     ,55,58,62,67,70
1760 DATA 74,85,83
1770 REM *** S. FRANCE/SPAIN
     ***
1780 DATA 81,83,84,82,80
     ,76,74,72,73,68
1790 DATA 65,63,59,57,55
     ,56,55,57,57,56
1800 DATA 58,64,64,70,74
     ,77,83,88,91,97
1810 DATA 97,99,98,90,94
1820 REM *** FRANCE ***
1830 DATA 97,99,103,105,107
     ,110,114,113
1840 DATA 116,117,120,121
     ,120,118,124
1850 DATA 124,122,119,122
     ,124,125,126,127
1860 REM *** FRANCE - BALTIC
     ***
1870 DATA 128,128,134,133
     ,135,135,135
1880 DATA 137,138,150,152
     ,154,157,153
1890 DATA 153,149,144,143
     ,141,141,139
1900 DATA 139,141,140,141
     ,138,137,138
1910 DATA 141,141
1920 REM *** BALTIC/SCANDINAVI
```

```
     A ***
1930 DATA 139,142,143,146
     ,150,158,157
1940 DATA 155,154,158,162
     ,168,168,171
1950 DATA 173,175,174,172
     ,169,171,176
1960 DATA 187,197,201,202
     ,198,196,192
1970 DATA 183,182,181,179
     ,174,169,162
1980 DATA 156,154,150,150
     ,145,146,150
1990 DATA 153,156,162,165
     ,167,169
2000 DATA 167,163,163,167
     ,168,170,173
2010 DATA 174,175,177,179
     ,181,184,187
2020 DATA 186,189,189,192
     ,195,196,207
2030 DATA 209,212,216,218
     ,219,222,222
2040 DATA 224,224,224,227
     ,227,229,227
2050 DATA 229,225,223,224
     ,223,224,218
2060 DATA 209,208,212,209
     ,208,200,199
2070 DATA 197,196,197,198
     ,201,202,201
2080 DATA 202,200,203,205
     ,213,215,218
2090 DATA 221,223,224,220
     ,218,219,228
2100 DATA 230
2110 REM *** SICILY ***
2120 DATA 44,48,49,51,51
     ,49,49,45,43,41
2130 REM *** COR/SARD ***
2140 DATA 60,64,68,68,66
     ,58,58,56,72,84
2150 DATA 76,78,69
2160 REM *** SJAELLAND ***
2170 DATA 145,145,148,150
     ,143,145
2180 REM *** ICELAND ***
```

```
2190 DATA 217,219,220,223
     ,223,227,229
2200 DATA 224,223,227,227
     ,223,223,217
2210 DATA 213,212,210,214
2220 REM *** UK ***
2230 DATA 128,127,129,128
     ,129,129,131
2240 DATA 132,133,134,136
     ,137,138,141
2250 DATA 141,143,144,145
     ,148,152,151
2260 DATA 154,156,158,157
     ,162,165,169
2270 DATA 173,172,167,166
     ,159,158,157
2280 DATA 151,145,144,142
     ,141,139,138
2290 DATA 139,138,133,132
     ,130,129,128
2300 REM *** IRELAND ***
2310 DATA 141,145,149,151
     ,157,157,158
2320 DATA 159,157,151,150
     ,145,142,142
2330 DATA 140
2340 REM *** TEST DATA ***
2350 DATA ATLANTIC OCEAN
     ,20,180
2360 DATA NORTH SEA,70,150
2370 DATA MEDITERRANEAN SEA
     ,50,60
2380 DATA BALTIC SEA,110
     ,160
2390 DATA BLACK SEA,170,85
2400 DEF PROCkey
2410 PRINT "PRESS ANY"
2420 PRINT "KEY TO"
2430 PRINT "CONTINUE"
2440 A=GET
2450 CLS
2460 ENDPROC
```

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